LINK LIGHT RAIL OPERATIONS AND MAINTENANCE SATELLITE FACILITY

DRAFT ENVIRONMENTAL IMPACT STATEMENT

APPENDIX E.3

Ecosystems Technical Report

May 2014

SOUNDTRANSIT
CENTRAL PUGET SOUND
REGIONAL TRANSIT AUTHORITY

U.S. Department of Transportation
Federal Transit Administration

LINK LIGHT RAIL OPERATIONS AND MAINTENANCE SATELLITE FACILITY ECOSYSTEMS TECHNICAL REPORT

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Acronyms and Abbreviations

BMPs	best management practices
CAO	Critical Area Ordinances
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
D	Developed
DNR	Department of Natural Resources
DPS	Distinct Population Segment
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
GMA	Growth Management Act
KCD	King County Conservation District
MBTA	Migratory Bird Treaty Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NGPA	Native Growth Protection Area
NHI	Natural Heritage Inventory
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
OMSF	Sound Transit Operations and Maintenance Satellite Facility
PHS	Priority Habitats and Species
RCW	Revised Code of Washington
SCS	Soil Conservation Service
SEPA	State Environmental Policy Act
SMA	Shoreline Management Act
SMPs	Shoreline Master Programs
SSHIAP	Salmon and Steelhead Habitat Inventory and Assessment Project
SWPPP	Stormwater Pollution Prevention Plan
TFW	Timber, Fish, and Wildlife
UMV	Urban moderately vegetated
UMVC	Urban mostly vegetated – coniferous forest
UMVD	Urban mostly vegetated – deciduous forest
UMVM	Urban mostly vegetated – mixed forest
USBEM	Urban Stream Baseline Assessment Evaluation Method
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USV	Urban sparsely vegetated
WAC	Washington Administrative Code
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
DNR	Washington Department of Natural Resources
WNHP	Washington Natural Heritage Program
WSDOT	Washington State Department of Transportation

Chapter 1
Introduction

An ecosystem is the interaction between plants, animals, microorganisms, and the physical environment in which they live. Ecosystems are made up of living organisms, including humans, and the environment they inhabit. Understanding this relationship is basic to the environmental review process and the assessment of impacts on ecosystems. This technical report addresses the ecosystem components—aquatic resources, vegetation and wildlife, and wetlands—near the Sound Transit Operations and Maintenance Satellite Facility (OMSF) Project (proposed project) alternatives. The report describes the affected environment as well as the expected temporary construction impacts and permanent operational impacts on these ecosystem resources for each of the build alternatives. It also discusses measures intended to avoid and minimize impacts and proposed compensatory mitigation for unavoidable impacts.

This report is organized into five parts, beginning with a summary of the proposed project, data-gathering activities, identification of related laws and regulations, definition of the study area, and assumptions (Section 1.0); followed by Section 2.0, Study Objectives and Methods; Section 3.0, Affected Environment; Section 4.0, Environmental Consequences; Section 5.0, Potential Mitigation Measures, and Section 6.0, References.

1.1 Project Description

The proposed project is expected to enable Sound Transit to meet the maintenance and storage needs of the expanded fleet of light rail vehicles (LRVs) identified in *Sound Transit 2: Making Connections, The Regional Transit System Plan for Central Puget Sound* (ST2). Approved by voters in November 2008, ST2 includes expanding Sound Transit's Link light rail transit system, which would require additional operations and maintenance facility capacity to support the added LRVs. Currently, Sound Transit has an existing light rail operations and maintenance facility, the Forest Street Operations and Maintenance Facility (Forest Street OMF), which is located in the industrial area of downtown Seattle. The Forest Street OMF is configured to serve up to 104 LRVs. To implement the ST2 expansion, Sound Transit would need to increase its LRV fleet to approximately 180 vehicles by 2023, which requires the proposed OMSF to be operational by the end of 2020.

Implementation of the proposed project would:

- Accommodate expansion of the Link light rail system to the Lynnwood Transit Center, the Overlake Transit Center, and Kent/Des Moines.
- Provide efficient and reliable light rail service and minimize system annual operating costs.
- Support regional long-range plans, including the Puget Sound Regional Council's VISION 2040 and Transportation 2040 plans, and the *Sound Transit Regional Transit Long-Range Plan* (LRP).

The proposed project would enable Sound Transit to provide service and inspection functions for a minimum of approximately 80 LRVs assuming that the Forest Street OMF would continue to provide inspection, heavy repair, and overhaul services. The OMSF would be used to store, maintain, and dispatch vehicles for daily service, Activities at the OMSF would include preventative maintenance

inspections, light maintenance, emergency maintenance, interior vehicle cleaning, and exterior vehicle washing. The facility would need to accommodate some administrative and operations functions and would be used as a report base for LRV operators. Space would be needed for employee parking, operations staff offices, maintenance staff offices, dispatcher work stations, an employee report room, and areas with lockers, showers, and restrooms for both operators and maintenance personnel.

Link light rail extensions of ST2 are planned in King and Snohomish Counties in the metropolitan Puget Sound region. Currently, planned and funded light rail extensions run from the City of Lynnwood in the north (Lynnwood Link Extension), to the City of Des Moines in the south (Federal Way Link Extension), and to the City of Bellevue in the east (East Link). The OMSF would be located proximate to and would connect with these planned lines to serve the operations and maintenance needs of the system. Section 2.7 of the OMSF Draft EIS describes the connections between the Lynnwood Link Extension and East Link projects; Section 3.9.3 of the OMSF Draft EIS describes the potential cumulative impacts of the OMSF and these components of ST2.

Four build alternatives were identified as meeting the purpose and need of the proposed project. A No Build Alternative, reflecting the conditions that would exist if the proposed project were not implemented, is also being considered.

1.1.1 Lynnwood Alternative

Under the Lynnwood Alternative, Sound Transit would construct the OMSF north of I-5 and east of 52nd Avenue/ W Cedar Valley Road in the City of Lynnwood. The OMSF footprint for the Lynnwood Alternative would require approximately 24 acres of land for all three design options. Approximately 37 to 41 acres would need to be acquired, given existing parcel boundaries, leaving approximately 9 to 13 acres for redevelopment. The proposed Lynnwood Link Extension alignment alternatives being evaluated in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013) would connect to the OMSF Lynnwood Alternative site. The Lynnwood Alternative for the OMSF includes three design options, each connecting to one of the three build alternatives being evaluated in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013). Design Option C1 would include lead track connecting to Lynnwood Link Extension Alternative C1, Design Option C2 would include lead track connecting to Lynnwood Link Extension Alternative C2, and Design Option C3 would include lead track connecting to Lynnwood Link Extension Alternative C3.

All three design options of the Lynnwood Alternative include a component located in Bellevue. This component of the alternative, referred to as the BNSF Storage Tracks, would be located within the Sound Transit-owned portion of the Eastside Rail Corridor and adjacent property north of NE 12th Street and south of SR 520 in the City of Bellevue. The BNSF Storage Tracks component of the Lynnwood Alternative would include facilities for LRV storage, operator report facilities, and interior cleaning functions for up to 32 LRVs to provide morning service to the Eastside.

1.1.2 BNSF Alternative

Under the BNSF Alternative, Sound Transit would construct the OMSF on property located between the former BNSF railway corridor on the west and 120th Avenue NE on the east, south of SR 520 and north of NE 12th Street in the City of Bellevue. This site is approximately 27 acres, including 2 acres of former BNSF right-of-way now under Sound Transit ownership, and is located along the adopted East Link revenue line northwest of the 120th Avenue NE station. The OMSF development footprint

on the site is approximately 23 acres leaving approximately 4 acres for redevelopment. Infrastructure for the proposed project would occupy most of the site leaving the southern portion available for other development.

1.1.3 BNSF Modified Alternative

Under the BNSF Modified Alternative, Sound Transit would construct the OMSF on both sides of the former BNSF railway corridor off of 120th Avenue NE on the east, south of SR 520 and north of NE 12th Street in the City of Bellevue. This site is located along the adopted East Link revenue line and is approximately 39 acres, including 2 acres of former BNSF right-of-way now under Sound Transit ownership. The OMSF development footprint on the site is approximately 24 acres leaving approximately 8 acres for future redevelopment. The storage tracks would be located on the western portion of the site, west of the rail corridor. Other OMSF facilities would be located adjacent to the east side of the rail corridor, leaving the frontage area along 120th Avenue NE available for other development. The design acknowledges the railbanked status of the former BNSF corridor by allowing sufficient width and vertical clearances to accommodate a future trail and future freight or passenger rail use of the corridor.

1.1.4 SR 520 Alternative

Under the SR 520 Alternative, Sound Transit would construct the OMSF south of SR 520 and north of Northup Way/NE 20th Street, east of 130th Avenue NE and west of 140th Avenue NE in the City of Bellevue. This site is located along the adopted East Link revenue line and is approximately 26 acres with the OMSF development footprint encompassing the entire site. Primary access to the site would be directly off of NE 20th Street west of 136th Place NE. The configuration of buildings under this alternative would vary from the other alternatives in that the operations offices would be in a separate building to the west of the LRV maintenance shops, and the LRV covered wash and service bay would be in a separate building east of the LRV maintenance shops.

1.2 Data Gathered

Sound Transit conducted a literature and data review to identify and characterize potentially affected resources in and near the project vicinity. Existing documentation and information was compiled and reviewed first so that the field reconnaissance effort could focus on filling information gaps. Existing natural resource information was gathered from local, state, and federal agencies. This information included published and unpublished reports, maps, websites, aerial photographs, and information gathered from agency staff familiar with resources within the project vicinity.

1.2.1 Agency and Organization Contacts

Sound Transit contacted the following local jurisdictions, agencies, and organizations (or their websites) for up-to-date information on ecosystems resources near the build alternatives:

- City of Bellevue Planning and Community Development, Transportation, Utilities, and Parks departments
- City of Lynnwood Planning and Community Development and Public Works departments
- Muckleshoot Indian Tribe

- Snoqualmie Indian Tribe
- Suquamish Tribe
- Duwamish Tribe
- Tulalip Tribes
- Yakama Nation
- National Marine Fisheries Service (NMFS)
- U.S. Army Corps of Engineers (Corps)
- U.S. Fish and Wildlife Service (USFWS)
- Washington Department of Fish and Wildlife (WDFW)
- Washington State Department of Natural Resources (DNR) Natural Heritage Program
- Washington State Department of Ecology (Washington State Department of Ecology) for 303d listing information

1.2.2 Maps and Existing Documentation

Maps and other existing reports were important resources used to identify ecosystem features within the project vicinity. The following map resources were used:

- Aerial photography of the project corridor from Google Earth and Bing
- *Bel-Red Corridor Project Draft EIS* (City of Bellevue 2007a) and Final EIS with 2009 amendments (City of Bellevue 2009a)
- *Bel-Red Subarea Plan* (City of Bellevue 2008c)
- PowerPoint Summary of the *Bel-Red Stormwater Management Plan* (City of Bellevue 2010b)
- Catalog of Washington Streams and Salmon Utilization maps
- Cities of Bellevue and Lynnwood websites for sensitive and protected species and habitat information
- *City of Lynnwood 2020 Comprehensive Plan* (City of Lynnwood 2011)
- *City of Bellevue Washington Comprehensive Plan* (City of Bellevue 2006a, 2006b, and 2012a, with amendments through October 31, 2012)
- *Puget Sound Salmon Recovery Plan* (Shared Strategy Development Committee 2005)
- *Hydric Soils of King County and Snohomish County* (Natural Resources Conservation Service [NRCS])
- Information from WDFW reports, maps, and databases
- Kelsey Creek and Tributaries 2010 Salmon Spawner Surveys (City of Bellevue 2011a)
- Kelsey Creek and Tributaries 2011 Salmon Spawner Surveys (City of Bellevue 2012b)
- *King County Conservation District (KCD) Soil Descriptions and Soil Report* (King County 2000a)
- King County sensitive areas map folio and wetland inventory (King County 1990)

- Mapping information from sources such as wetland delineation reports and stream studies by other consulting firms, as available
- Publications of the Washington Natural Heritage Program (WNHP), available at <http://www1.dnr.wa.gov/nhp/refdesk/pubs/index.html> (Washington State Department of Natural Resources 2013a)
- *Salmon and Steelhead Habitat Limiting Factors Report for the Lake Washington Watershed* (WRIA 8) (Kerwin 2001)
- *Sammamish River Corridor Conditions and Enhancement Opportunities Report* (King County 1993)
- Bellevue Shoreline Analysis Report – Appendix D, Maps: Wetlands and Streams and WDFW Priority Habitats and Species (City of Bellevue 2009b)
- Shoreline Inventory Report – Technical Appendix Volume I, Wetlands (City of Bellevue 2008a)
- Shoreline Inventory Report – Technical Appendix Volume II, Habitat (City of Bellevue 2008b)
- *East Link Project Final EIS* and related *Ecosystems Technical Report* (Sound Transit 2011)
- *Lynnwood Link Extension Draft EIS* and related *Ecosystems Technical Report* (Sound Transit 2013)
- U.S. Geological Survey (USGS) topographic maps (1:24,000)
- U.S. Soil Conservation Service (SCS) soil survey maps of King County (Snyder et al. 1973) and Snohomish County (Debose and Klungland 1983)
- USFWS National Wetlands Inventory (NWI) maps (1:24,000)
- WDFW fish distribution database (Washington Department of Fish and Wildlife 2013) (http://wdfw.wa.gov/mapping/salmonscape/index.html)
- WDFW Priority Habitats and Species (PHS) maps (1:24,000) (Washington Department of Fish and Wildlife 2012)
- Wetland and stream inventories for the Cities of Bellevue and Lynnwood, as available
- Wildlife Habitat Profile (King County 1987)

1.3 Related Laws and Regulations

The following federal, state, and local laws, regulations, and agency jurisdiction and management guidance describe the applicable requirements for wetlands; threatened and endangered species, wildlife, and aquatic species and habitat for these species; and high-value habitats and species:

1.3.1 Federal

- Executive Orders 89-10, 90-40, and 11990
- Endangered Species Act (ESA)
- Migratory Bird Treaty Act (MBTA)
- Bald and Golden Eagle Protection Act

- Magnuson-Stevens Fishery Conservation and Management Act (MSA)
- National Environmental Policy Act (NEPA)
- Sections 404, 402, and 401 of the Clean Water Act (CWA)

1.3.2 State

- Growth Management Act (GMA) (Revised Code of Washington [RCW] 36.70A)
- Washington State Water Pollution Control Act
- Shoreline Management Act (SMA)
- State Environmental Policy Act (SEPA)
- Washington State Hydraulic code (Washington Administrative Code [WAC] Chapter 222-110)
- WDFW PHS Management Recommendations

1.3.3 Local

- Critical Area Ordinances (CAOs) for the Cities of Bellevue and Lynnwood
- Local agency Shoreline Master Programs (SMPs)

1.4 Study Areas

Each resource required a specific study area, defined based on the nature of the resource and the corresponding area of potential effects, as described below.

1.4.1 Aquatic Resources

Aquatic habitats include ponds, lakes, rivers, streams, and surface water drainage ditches, along with adjacent riparian (streamside) habitat and regulated buffers. The study area for aquatic resources is defined as all aquatic habitats occurring within the build alternative sites, within 200 feet of the site boundaries, and from 100 feet upstream to 300 feet downstream of the site boundaries for streams and other watercourses that pass through the build alternative sites. The 300-foot downstream limit is based on WAC 73-201A-400 and represents the typically accepted mixing zone boundary for measuring water quality effects in streams and rivers from project-related activities.

1.4.2 Vegetation and Wildlife Resources

For vegetation and wildlife, the study area is the area within the defined construction limits, the area that would be disturbed during construction of the proposed project under each of the build alternatives, and additional adjacent vegetation or habitat as appropriate. For example, a wetland or forested area occurring partially within and partially outside a build alternative site was treated as a single patch of habitat that could be affected by the proposed project. Habitat for individual species was assessed as biologically appropriate for that species. For example, bald eagle nesting or breeding locations up to 1 mile from the build alternative sites were considered.

1.4.3 Wetland Resources

Wetlands are defined by soil characteristics, presence or absence of hydrology, and dominance of vegetation adapted to wet environments. Many wetlands are considered jurisdictional waters of the United States (waters of the United States) by the Corps) and are protected by federal and state regulations and local CAOs. The wetland resources study area is defined as all areas inclusive of 200 feet on all sides of the defined project limits. Also included are wetlands that are partly within or cross through the study area. Portions of wetlands that extend beyond the study area and potential wetland areas outside of the field reconnaissance survey area were identified and described based on visual observation from public areas during the field reconnaissance; current local, state, and federal wetland maps; critical area reports; and aerial photograph examination.

Wetland buffers, which depend on wetland category and are set by local CAOs, were also included in the evaluation of project impacts. Depending on the proximity of a wetland to the outer extent of the project limits, wetland buffers may extend beyond the wetland study area.

1.5 Assumptions

1.5.1 Impact Assessment

A series of assumptions regarding the extent and duration of impacts, as well as measures that would avoid, minimize, and restore affected areas are required to analyze and estimate project impacts. Impacts include temporary construction impacts necessary for project construction, and permanent operational impacts within the project area. The following sections define the impact assessment assumptions made relative to aquatic resources and wetlands and relative to vegetation and wildlife.

1.5.1.1 Assumptions Regarding Construction Impacts

For the impact analysis, Sound Transit assumes that all aquatic resources, vegetation, and wetlands within the limits of the specific facilities proposed under each alternative (including the area beneath the elevated tracks joining the proposed project to other Sound Transit planned systems (i.e., Lynnwood Link Extension and East Link projects) would be removed during construction and any habitat value of such areas eliminated. Additional permanent impacts associated with operation of the OMSF are addressed in Section 1.4.1.2.

Temporary Construction Impacts

Sound Transit assumes that all upland or wetland/riparian vegetation that is temporarily disturbed outside of the project limits (i.e., within the construction access areas and related rights-of-way) would be restored after construction is completed. Site restoration would include replanting disturbed areas, with appropriate native vegetation, immediately following construction. However, the length of time required for restoration areas to effectively replace pre-project functions would vary depending on the type, age, and diversity of the plant community in such areas.

Sound Transit also assumes that land within the construction limits and related rights-of-way associated with the elevated guideways which would provide access between the OMSF and the

Lynnwood Link Extension or East Link lines (as appropriate) would be temporarily disturbed during construction, and such areas similarly restored following construction.

Sound Transit assumes that the overall extent and magnitude of potential temporary construction impacts would be controlled by the types of construction activities and by the implementation of best management practices (BMPs) as presented in Appendix A. These BMPs would be designed to accommodate site-specific characteristics such as widths of wetland and stream buffers. These BMPs are expected to effectively avoid or minimize temporary construction impacts (as well as permanent operational impacts) on all ecosystem resources.

Assumptions Regarding Temporary Construction Impacts on Aquatic and Wetland Resources

Sound Transit assumes that the principle sources of temporary construction impacts on aquatic and wetland resources would be direct temporary disturbance of a water body, wetland, or adjacent riparian habitat, sediment-laden surface water runoff from the construction area discharged to a water body, and construction-related pollutants entering a water body or wetland. Sound Transit assumes that any direct effects on a water body or riparian habitat would be stabilized as soon as possible after a disturbance to minimize subsequent effects on water quality parameters, such as turbidity and sedimentation.

Sound Transit assumes that different types of ground-disturbing activities each create a different risk of impacts on aquatic and wetland resources (i.e., a low, moderate, or high risk), as described in Table 1-1.

Table 1-1. Example Situations for Assessing Sedimentation Risk to Aquatic Resources in the Study Area

High Sedimentation Risk	Moderate Sedimentation Risk	Low Sedimentation Risk
Earthwork that is done: • Within OHWM • Very close to water body • On steep slopes next to water body • On bare or erodible soil types on moderate to steep slopes • During wet season	Earthwork that is done: • On level ground next to water body • On bare or erodible soil types on shallow slopes	Earthwork that is done: • Distant from water body • Separated from water body by vegetated buffer • Adjacent to piped water body • With minimal earthwork or soil disturbance

OHWM = ordinary high water mark

The potential impact of construction-related pollutants (i.e., fuel spills, concrete leaching, and hydraulic fluid leaks) would also vary based on the size of the area affected, the amount of the pollutant, its chemical properties, and the proximity of the pollutant source to the water body or wetland. The effects of these types of pollutants would also vary depending on the degree and type of use of the affected areas by fish and other aquatic species (e.g., spawning areas versus migratory areas). Sound Transit assumes that the effect of temporary impacts specific to wetlands (and their buffers) would vary based on the vegetation type (e.g., forested, scrub-shrub, or emergent wetland) and associated habitat functions provided by the wetland. Temporary impacts on forested and scrub-shrub wetlands are assumed to be of longer duration and, thus, larger effect than impacts on emergent wetlands because of the longer period necessary to reestablish mature tree and shrub communities. For example, temporary clearing of emergent wetland or herbaceous buffer vegetation for construction access is assumed to have a short-term impact on wetland functions

because emergent wetland vegetation would be expected to recolonize/regrow more rapidly than if a forested or scrub-shrub wetland or buffer were temporarily cleared (Washington State Department of Ecology et al. 2006a). In contrast, temporary impacts on forested areas may last for years due to the loss of large individual trees and associated changes to the canopy, sub-canopy, shrub, and herbaceous layers that result. Temporary impacts on forested areas can also affect water levels within a wetland due to the loss of evapotranspiration from the canopy of large trees and an increase in surface evaporation due to a decrease in shade in the wetland.

Assumptions Regarding Temporary Construction Impacts on Vegetation and Wildlife Resources

As previously described, the impact assessment assumes that vegetation within the construction limits and related rights-of-way associated with the elevated guideways would be temporarily removed for project construction. Sound Transit assumes that all vegetation that is temporarily disturbed outside of the project limits (i.e., within the construction access areas and related rights-of-way) would be restored after construction is completed. Site restoration would include replanting disturbed areas, with appropriate native vegetation, immediately following construction. The duration of the impact on temporarily disturbed vegetation would depend on the type of vegetation disturbed and the amount of time it would take to regenerate. Noise caused by construction activity and machinery and the associated potential for disturbance to wildlife is also assumed temporary.

1.5.1.2 Assumptions Regarding Permanent Operational Impacts

For the impact analysis, Sound Transit assumes that all vegetation (and thus, wildlife habitat) within the build alternative sites would be permanently affected and all vegetation, wetlands, and aquatic resources would be removed permanently from these areas. Consequently, any habitat value of these areas for fish and wildlife would be eliminated.

Assumptions Regarding Permanent Operational Impacts on Aquatic and Wetland Resources

Permanent operational impacts on aquatic and wetland resources consist of the alteration of existing habitat, whether in a beneficial or adverse manner. Beneficial effects would include improvements in fish passage (e.g., through replacement of culverts or bridges) or improvements in habitat quantity or quality, which may include restoring degraded habitat or the creation of additional or replacement habitat. Adverse effects would include the removal of riparian and wetland vegetation, filling of wetlands, increasing the stormwater runoff and decreasing groundwater infiltration from constructed impervious surfaces, and alteration of natural habitat characteristics (e.g., installing culverts, straightening streams, and installing riprap bank armoring). The permanent removal of riparian and/or wetland buffer vegetation within 200 feet of water bodies would eliminate potential future sources of woody debris and organic material recruitment to wetlands and stream channels and preclude the recovery of this ecological function (specifically affecting the Lynnwood Alternative).

Additional permanent or long-term impacts may include potentially degraded surface water quality from stormwater runoff discharge (e.g., increased pollutant loading) and increased potential for accidental spills or leaks of fuel, oil, hydraulic fluids, and solvents during facility operation. In addition, the development of extensive permanent infrastructure may preclude future restoration

actions, such as the replacement or retrofit of culverts or other stream crossings that are barriers to fish passage (specifically affecting the SR 520 Alternative).

Permanent wetland and buffer impacts result from direct removal/fill of the wetland's area and the consequent loss of specific functions (e.g., water quality improvement, stormwater detention and erosion reduction, and wildlife habitat), including loss of buffer functions such as screening from disturbance, wildlife habitat, and erosion or sedimentation protection. Sound Transit assumes permanent wetland and buffer impacts could also result indirectly from impacts on a wetland's hydrologic characteristics (e.g., the depth and duration of seasonally ponded surface water), or to the portion of the wetland able to support tree and shrub vegetation (such as could occur beneath an elevated section of track), or as a result of isolation of the wetland and buffer from other wetlands or areas of valuable upland habitat that contribute to its wildlife habitat functions (such as could occur in areas with a concentration of multiple sections of tracks or other facilities).

Assumptions Regarding Permanent Operational Impacts on Vegetation and Wildlife Resources

Based on the assumption that all areas of vegetation would be cleared and graded and that all vegetation would be eliminated in each build alternative site, Sound Transit assumes that all related wildlife habitat would be permanently eliminated from within the project limits. The impact assessment assumes wildlife would be displaced (e.g., mobile species such as birds) or destroyed (e.g., small, slower moving species such as amphibians, reptiles, and small mammals) within the project limits. Permanent impacts on wildlife were also assumed in cases where the habitat value of adjacent areas of vegetation could be reasonably expected to decline due to the noise and activity inherent in the operation of the OMSF.

1.5.2 Site Restoration

Sound Transit assumes that, to the extent practicable, any temporary impacts on areas supporting native upland or wetland vegetation and stream banks located within the construction limits (but outside of the project limits) would be restored to their former condition (but with elimination of any invasive vegetation species) after completion of construction. Site restoration features would be installed immediately following construction to restore temporarily disturbed areas. As noted previously, the length of time that would be required for restoration of temporarily affected functions (including wildlife habitat functions) to pre-project levels would vary depending on the nature and type of vegetation disturbed.

1.5.3 Avoiding and Minimizing Impacts on Sensitive Ecosystem Resources

Appendix A of this report provides a compilation of BMPs that Sound Transit assumes would be used to avoid or minimize project construction and operational impacts on sensitive ecosystem resources, including state and federal protected species and their habitats, wetlands, and aquatic resources. These BMPs are typically either required by state or federal agencies to obtain the permits that would be necessary for the proposed project or may be required to comply with permit conditions. Sound Transit assumes that these BMPs would be implemented at appropriate locations and that they would perform as intended and thus would function to avoid or minimize impacts on sensitive ecosystem resources.

Chapter 2
Study Objectives and Methods

This chapter describes the objectives and methods used to characterize the nature and extent of the aquatic resources (Section 2.1), vegetation and wildlife resources (Section 2.2), and wetland resources (Section 2.3) within the study areas associated with each resource, relative to the build alternatives.

2.1 Aquatic Resources

This section describes the objectives of the aquatic resources investigations and the methods used to characterize aquatic resources within the study area and identify potential impacts on those resources, which could result from the build alternatives.

2.1.1 Aquatic Resources Study Objectives

The purpose of the aquatic resources investigation is to describe the aquatic resources near the build alternative sites and the potential for impacts on these resources. Objectives included the following:

- Characterize all surface water bodies and riparian habitat near the project limits for each alternative.
- Identify all water bodies potentially affected (directly or indirectly) by the construction and/or operation of each alternative.
- Identify aquatic resources (potential species occurrence and use) of the surface water bodies near each build alternative.
- Identify potential effects of the proposed project on aquatic resources near each alternative.
- Identify avoidance, minimization, and mitigation opportunities to offset potential direct and indirect effects of each alternative on aquatic resources.

2.1.2 Aquatic Resources Methods

2.1.2.1 Review of Existing Information

Sound Transit conducted a literature and data review of available information on aquatic resources in the alternative project areas to identify and characterize potentially affected resources. Sound Transit reviewed the sources listed in Section 1.1.2 to gather information regarding the presence and condition of aquatic habitat (i.e., streams, rivers, lakes, and drainage ditches) and the presence and expected use of the aquatic habitat by resident and anadromous fish, and other aquatic species. Existing documentation and background information were verified and supplemented during a field reconnaissance visit to each build alternative site.

2.1.2.2 Agency Coordination

Federal, state, and local agencies were contacted for information regarding existing conditions in the study area. For example, WDFW was contacted for information on PHS via their PHS database (Washington Department of Fish and Wildlife 2012). The WDFW online databases of salmonid fish distribution and escapement information were accessed to provide historic and recent fish population information (Washington Department of Fish and Wildlife 2013). The limiting habitat factors report for Lake Washington watershed habitat by the Washington Conservation Commission was also reviewed to assess specific concerns for the drainages potentially affected by the proposed project (Kerwin 2001).

Sound Transit contacted the City of Bellevue Planning and Community Development Department in January 2013, to request any documents related to ecosystem resources within the study area produced since 2009, the year that the *East Link Project Draft EIS* was produced, which examined the same information in the same area. Reports prepared by and for the City of Bellevue provided information on anadromous fish species occurrence, habitat, watershed conditions, spawner surveys, and fish passage assessments at culverts for streams in the Kelsey Creek watershed. Annual salmon spawner surveys conducted in the Kelsey Creek drainage, by the City of Bellevue, provided details on the distribution and use of streams by anadromous species (City of Bellevue 2011a, 2012b). The City of Bellevue also conducts annual peamouth minnow spawning assessments in Kelsey Creek, and other drainages in the city (City of Bellevue 2011b).

Because there is no anadromous fish access to the Lynnwood Alternative site, there are no fish surveys specific to Lynnwood that are relative to this analysis, other than the information provided in the references listed in Sections 1.1.2 and 2.1.2.1.

2.1.2.3 Identification of Federal and State Threatened, Endangered, and Candidate Species, and Federal Species of Concern

Species proposed or listed under the ESA, which may occur within the areas potentially affected by the proposed project were identified from species lists on the NOAA Fisheries web site (National Marine Fisheries Service 2013a) and the USFWS website (U.S. Fish and Wildlife Service 2013). Information regarding species occurrence and distribution was also obtained from the WDFW PHS database received August 30, 2012, and a review of available literature (Washington Department of Fish and Wildlife 2012).

Three federally listed fish species are known to occur, or could occur, within the area potentially affected by the proposed project. The ESA-listed fish species identified are:

- Chinook salmon (*O. tshawytscha*) Puget Sound Evolutionarily Significant Unit (ESU) (Threatened),
- Bull trout (*Salvelinus confluentus*) Coastal/Puget Sound Distinct Population Segment (DPS) (Threatened), and
- Steelhead trout (*O. mykiss*) Puget Sound ESU (Threatened).

Designated critical habitat occurring in or near the project area includes:

- Puget Sound Chinook salmon ESU, and
- Coastal/Puget Sound bull trout DPS.

In addition to these three ESA-listed species, coho salmon (*Oncorhynchus kisutch*), Pacific lamprey (*Lampetra tridentata*), and river lamprey (*Lampetra ayresi*) are identified as federal species of concern, and could occur in the streams potentially affected by the proposed project, although specific information is lacking.

2.1.2.4 Reconnaissance of Water Bodies

Analyses of aquatic habitats in the study areas of several of the alternatives in Bellevue were conducted in March 2007, for the *East Link Project Final EIS* (Sound Transit 2011). These same areas are also included in the proposed project as the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative. The *East Link Project Final EIS* analysis and its *Ecosystems Technical Report* (Sound Transit 2011) were reviewed for information regarding aquatic habitat conditions in these three build alternative sites. The Sound Transit *Lynnwood Link Extension Draft EIS* and *Ecosystems Technical Report* (Sound Transit 2013) were similarly reviewed for information regarding aquatic habitat conditions in the Lynnwood Alternative site. In addition, a field reconnaissance was conducted on December 5, 2012, to visually reassess aquatic habitat conditions within the study areas of each of the build alternative sites (from publically accessible areas) to determine whether site conditions were consistent with those described at the time those documents were prepared.

The 2012 reconnaissance consisted of a qualitative visual survey of the study areas associated with each of the build alternatives, to determine whether conditions observed in 2007 still represented existing site conditions in the Bellevue study areas, as previously evaluated for the *East Link Project Final EIS* (Sound Transit 2011). A similar qualitative assessment was also conducted for the Lynnwood Alternative site to determine whether conditions were still consistent with those previously evaluated in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013). The 2012 field assessments included evaluations of habitat extending from at least 100 feet upstream to 300 feet downstream from the project site boundaries, as well as other water bodies within 200 feet of the site boundaries. Aquatic habitat assessments were based on known or likely fish use and their habitat requirements by life stage, and direct field observations. This assessment incorporated the assumption that downstream anadromous fish barriers could one day be corrected, allowing the use of stream habitat that is currently inaccessible. The determination of the current condition of such fish passage barriers was limited to visual observations in the areas surveyed, while the condition of downstream barriers was assumed to be as identified in WDFW databases.

Detailed results of the previous surveys are included in the documentation for the *East Link Project Final EIS* (Sound Transit 2011), and summarized below. This information was re-assessed in 2012 during the field reconnaissance, which included qualitative (visual) assessments of the following elements:

- Overall in-stream and riparian habitat quality,
- Potential fish passage barriers,
- Existing surface water drainage patterns,
- Potential limiting factors related to site development, and
- Potential mitigation opportunities.

Color aerial orthophotographs (i.e., aerial photographs adjusted for topography, lens distortion, and camera tilt) using a 1-inch = ~570 feet scale were created prior to the field reconnaissance to depict all areas within 500 feet of either side of the build alternative sites. Water bodies were mapped

during the field reconnaissance and then cross-referenced with existing stream location and configuration data (Washington Department of Fish and Wildlife 2013) for this report.

The presence of a defined bed and bank and the presence of an ordinary high water mark (OHWM) based on bank erosion, changes in vegetation, and water staining (i.e., evidence of the flow of water), are typically used to determine if there are streams within a study area. The WAC definition of ordinary high water mark (OHWM) is used as the standard for determination (WAC 173.22.30[11]): "Ordinary high water mark on all lakes, streams, and tidal water is that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland."

During a visual reconnaissance without property access, visual observations of areas with potential bed and bank features were limited to areas immediately adjacent to, or visible from, publicly accessible roadways/rights-of-way, or visible from these public areas.

Visible topography, erosion, and dominance of hydrophytic vegetation (or lack thereof) were used as an indicator of potential conditions that might indicate a seasonal stream and thus were used to make a reconnaissance-level determination of the possible presence of seasonal streams in cases where surface hydrology was not evident.

2.1.2.5 Detailed Analysis of Aquatic Habitat

The 2007 aquatic habitat surveys completed for the *East Link Project Final EIS* were assessed by fisheries biologists. Aquatic habitat surveys were also completed for the *Lynnwood Link Extension Draft EIS*. A similarly experienced fish biologist conducted the 2012 reconnaissance surveys to determine whether aquatic conditions, which could be determined without private property access, were still consistent with those previously evaluated in the *East Link Project Final EIS* and the *Lynnwood Link Extension Draft EIS*. During the 2012 surveys, aquatic resources were photographed and described to assess site-specific characteristics that could be affected by the build alternatives. Culverts and other potential fish passage barriers were also photographed and described for assessing the extent of potential fish passage issues.

2.1.2.6 Water Body Classification and Stream Buffer Width Designations

Water body classification was determined based on the State of Washington Interim Water Typing System (WAC 222-160-031), and the City of Bellevue and City of Lynnwood classification systems. Both systems are hierarchical, but the state's system is based on physical parameters such as channel width and gradient, and applies these characteristics to a determination of presumed/potential use by salmonids. In contrast, the City of Bellevue and City of Lynnwood classification systems are based more on streamflow and documented/existing salmonid usage.

The state's interim water typing system categories are as follows:

1. **Type 1 Water**: All waters, within their ordinary high-water mark, as inventoried as "shorelines of the state" under chapter 90.58 RCW and the rules promulgated pursuant to chapter 90.58 RCW, but not including those waters' associated wetlands as defined in chapter 90.58 RCW.
2. **Type 2 Water:** Type 2 Water means segments of natural waters that are not classified as Type 1 Water and have a high fish, wildlife, or human use. These are segments of natural waters and periodically inundated areas of their associated wetlands, which:

a) Are diverted for domestic use by more than 100 residential or camping units or by a public accommodation facility licensed to serve more than 10 persons, where such diversion is determined by the department to be a valid appropriation of water and only considered Type 2 Water upstream from the point of such diversion for 1,500 feet or until the drainage area is reduced by 50 percent, whichever is less;

b) Are diverted for use by federal, state, tribal or private fish hatcheries;

c) Are within a federal, state, local, or private campground having more than 30 camping units;

d) Are used by fish for spawning, rearing or migration. Waters having the following characteristics are presumed to have highly significant fish populations:

i. Stream segments having a defined channel 20 feet or greater within the bankfull width and having a gradient of less than 4 percent.

ii. Lakes, ponds, or impoundments having a surface area of 1 acre or greater at seasonal low water; or

e) Are used by fish for off-channel habitat. These areas are critical to the maintenance of optimum survival of fish. This habitat shall be identified based on the following criteria:

i. The site must be connected to a fish bearing stream and be accessible during some period of the year; and

ii. The off-channel water must be accessible to fish through drainage with less than a 5% gradient.

3) Type 3 Water: Segments of natural waters which are not classified as Type 1 or 2 Waters and have a moderate to slight fish, wildlife, or human use. These are segments of natural waters and periodically inundated areas of their associated wetlands which:

a) Are diverted for domestic use;

b) Are used by fish for spawning, rearing or migration. If fish use has not been determined:

i. Waters having any of the following characteristics are presumed to have fish use:

(A) Stream segments having a defined channel of 2 feet or greater within the bankfull width in Western Washington; and having a gradient of 16 percent or less;

(B) Stream segments having a defined channel of 2 feet or greater within the bankfull width in Western Washington; and having a gradient greater than 16 percent and less than or equal to 20 percent, and having greater than 50 acres in contributing basin size in Western Washington based on hydrographic boundaries;

(C) Ponds or impoundments having a surface area of less than 1 acre at seasonal low water and having an outlet to a fish stream;

(D) Ponds of impoundments having a surface area greater than 0.5 acre at seasonal low water.

ii. The department (of Ecology) shall waive or modify the characteristics in (i) of this subsection where:

(A) Waters have confirmed, long term, naturally occurring water quality parameters incapable of supporting fish;

4) **Type 4 Water:** All segments of natural waters within the bankfull width of defined channels that are perennial nonfish habitat streams. Perennial streams are flowing waters that do not go dry any time of a year of normal rainfall and include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow.

5) **Type 5 Water:** means all segments of natural waters within the bankfull width of the defined channels that are not Type 1, 2, 3, or 4 Waters. These are seasonal, nonfish habitat streams in which surface flow is not present for at least some portion of the year and are not located downstream from any stream reach that is a Type 4 Water. Type 5 Waters must be physically connected by an above-ground channel system to Type 1, 2, 3, or 4 Waters.

The City of Bellevue classification system categories are as follows:

- **Type S waters**: All waters, within their bankfull width, as inventoried as "shorelines of the state," including periodically inundated areas of their associated wetlands.
- **Type F waters:** Segments of waters that are not Type S waters and that contain fish or fish habitat, including waters used by hatcheries.
- **Type N waters:** All segments of waters that are not Type S or F waters and that are physically connected to Type S or F waters by an aboveground channel system, stream, or wetland.
- **Type O waters:** All segments of waters that are not Type S, F, or N waters and that are not physically connected to Type S, F, or N waters by an aboveground channel system, stream, or wetland.

The City of Lynnwood classification system categories are as follows:

- **Category I:** Scriber Creek, Swamp Creek, and Halls Creek.
- **Category II:** Streams that flow year-round or that are used by salmonids.
- **Category III:** Streams that are naturally intermittent and are not used by salmonids.

The Cities of Bellevue and Lynnwood have jurisdiction over stream buffers, which are regulated through their respective CAOs and are based on the stream type or category as derived from their respective CAOs. Table 2-1 lists the minimum stream buffer widths for the various stream classifications, although wider buffers may be required based on specific project designs, site-specific conditions, and species use or potential use. Setback of structures from the outer edge of the stream buffer is also typically required, with widths varying based on the stream type and, in Bellevue, on whether the site is developed or undeveloped.

Table 2-1. Classification and Buffer Requirements for Streams Located in the Study Area

Stream Classification System	Stream Type/Class	Stream Buffer for Undeveloped Sites (feet)[a,b,c]	Stream Buffer for Developed Sites (feet)[a,b,c]
City of Lynnwood	Category I	100	
	Category II	60	
	Category III	35	
City of Bellevue	Type S	100	50
	Type F	100	50
	Type N	50	25
	Type O	25	25

Sources: City of Bellevue Critical Areas Ordinance (Land Use Code 20.25H.025), City of Lynnwood Critical Areas Ordinance (Ordinance 2598).

[a] Regardless of stream type, West Tributary of Kelsey Creek shall have a stream critical area buffer of 50 feet

[b] Bellevue streams on undeveloped sites also have a structure setback of 10 to 20 feet from the outer edge of the buffer, depending on stream type; Bellevue streams on developed sites have a structure setback of 0 to 50 feet setback from the outer edge of the buffer, depending on stream type (BMC 20.25H.075.D2).

[c] All streams in Lynnwood have a 15 foot building setback from the stream buffer edge (LMC 17.10.070).

2.1.2.7 Impact Assessment

Sound Transit evaluated potential impacts of the build alternatives on aquatic resources by overlaying the limits of each build alternative on the aquatic habitat characterization map created for the proposed project, including the location and size of storm drain pipes and stormwater treatment/detention ponds, and other aquatic resources. For this analysis, Sound Transit reviewed proposed construction areas and construction methods to determine areas where erosion, dust, and vegetation disturbance/removal could directly or indirectly affect tributaries and surface water drainage systems in the study area. Sound Transit also evaluated reports and assessments of similar projects.

2.2 Vegetation and Wildlife Resources

This section describes the objectives of the vegetation and wildlife investigations and the methods used to characterize the vegetation and wildlife habitats within the project vicinity and to identify potential impacts on those habitats. It includes a discussion of threatened and endangered species, species of concern, and high-value habitats within the vegetation and wildlife study areas.

2.2.1 Vegetation and Wildlife Resources Study Objectives

The purpose of the vegetation and wildlife investigation was to describe these ecological resources in the study areas and to identify and describe potential impacts of the build alternatives on these resources. Objectives included the following:

- Identify important terrestrial habitats and wildlife resources, such as migratory and resident species reported to occupy habitats within and adjacent to the study area for each alternative.
- Identify any federal- or state-listed endangered, threatened, or candidate species that may occur within the vicinity of the study area for each alternative.
- Identify suitable habitat for any federal-or state-listed endangered, threatened, or candidate species that may occur within the study area for each alternative.
- Conduct a reconnaissance-level survey of terrestrial habitats to describe plant communities and wildlife habitats within the study area for each alternative.
- Describe potential impacts from the build alternatives on plant communities and wildlife habitats, including temporary construction impacts and permanent operational impacts.
- Propose mitigation measures to avoid, minimize, or compensate for any unavoidable adverse impacts.

2.2.2 Vegetation and Wildlife Resources Methods

2.2.2.1 Review of Existing Information

Sound Transit obtained and reviewed existing data on study area vegetation communities, wildlife, and wildlife habitat from several sources, including local, state, and federal agencies. Sound Transit also obtained and reviewed existing maps and aerial photographs of the study area.

Existing data on plant communities and/or wildlife habitat included:

- DNR, Natural Heritage Inventory (NHI) Database of rare plants and native communities (Washington State Department of Natural Resources 2012);
- WDFW Priority Habitats and Species (PHS) database (Washington Department of Fish and Wildlife 2012);

An analysis of wildlife and habitats was conducted for the *East Link Project Final EIS* (Sound Transit 2011: Appendix H3). The study area for that project included the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites considered in this analysis. That analysis, as well as the Sound Transit *Lynnwood Link Extension Draft EIS and Ecosystems Technical Report* (Sound Transit 2013), were reviewed for information on vegetation, wildlife, and habitats in the study area for each build alternative. In addition, aerial photographs of the study area were reviewed and a field reconnaissance was conducted on December 5, 2012, to ground-truth the aerial photos and gather more detailed information on the vegetation and wildlife habitat attributes in the study area for each build alternative.

Published sources of data were used as references on species distribution and habitat requirements. These included various field guides to birds, mammals, reptiles, and amphibians, and *Wildlife-Habitat Relationships in Oregon and Washington* (Johnson and O'Neil 2001). Online databases referenced include the *NatureServe* database (NatureServe 2013) and DNR *Washington Herp Atlas* (Washington State Department of Natural Resources et al. 2011). The WDFW PHS database was used to determine known locations of threatened, endangered, sensitive, and concern species and well as the location of critical habitats within a 1-mile radius of each build alternative site.

2.2.2.2 Identification of Federal and State Threatened, Endangered and Candidate Species and Federal Species of Concern

Sound Transit analyzed the likely presence or absence of listed wildlife species based on their known distributions, the presence or absence of suitable habitat in the study area, and species-specific sighting locations from the WDFW PHS database. Data regarding the distribution of ESA-protected wildlife species were obtained from the USFWS (2013) online database and the *Washington Herp Atlas* (an online atlas of information on rare amphibians and reptiles) (Washington State Department of Natural Resources et al. 2011).

Sound Transit analyzed the likely presence or absence of federal and state listed plant species based on their known distributions, the presence or absence of suitable habitat in the study area, and species-specific sighting locations from the DNR NHI Database (Washington State Department of Natural Resources 2012) and *Rare Plant Lists* for Snohomish and King Counties (Washington State Department of Natural Resources 2013b). Data regarding the distribution of ESA-protected plant species were obtained from the USFWS (2013) online database. Recorded occurrence and distribution data for rare plants in King and Snohomish counties were obtained from publications accessed through the WNHP website (Washington State Department of Natural Resources 2013b). WNHP maintains site-specific data regarding rare, endangered, threatened, and sensitive wildlife, plants, and important ecological communities. Additional information regarding the habitats of listed plants was obtained from the University of Washington (UW) Herbarium online database (UW Herbarium 2013), the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) PLANTS database (U.S. Department of Agriculture 2013), and the *Flora of North America* database (2013).

Priority species in Washington include all state endangered, threatened, sensitive, and candidate species, as well as federal endangered, threatened, candidate, and species of concern. Sound Transit obtained data regarding rare wildlife species and habitats from the WDFW PHS database. In addition to publicly available information, WDFW provided site-specific data regarding the occurrence of rare plant communities, plants, wildlife, and wildlife habitat in the project vicinity in response to a project-specific request for these data. WDFW publications that were reviewed included the PHS database (2012) and associated status reports on species with known occurrences near the study area such as the peregrine falcon and bald eagle.

Further literature reviews were required to determine whether habitat suitable for any state priority or listed species occurred within the project vicinity. This research was necessary because of the nature of PHS wildlife distribution data, which typically are very complete for larger, higher-profile species that are easily monitored and for which there are active monitoring efforts, but are often less comprehensive for lower-profile species.

Sound Transit used additional literature review combined with general habitat determinations for each affected potential habitat area to evaluate habitat suitability and potential presence for all PHS wildlife species occurring and likely occurring within the study area. Species that are not likely to occur in the study area were removed from consideration (e.g., Oregon spotted frog, Western pond turtle). Species occurrence in the study area was further assessed based on the habitat requirements of that species, habitats present in the study area, the location of known populations, and whether any historical or recent sightings of that species have occurred in King or Snohomish Counties. Any species that fit those criteria were added as either known to occur in the study area, likely present

(i.e., having known historical or recent sightings and suitable habitat present), or possibly occurring (i.e., some habitat elements present at the site and populations known to occur in the general area).

2.2.2.3 Coordination with Agencies and Interest Groups

Local, state, and federal agencies were contacted for information regarding existing wildlife and vegetation site conditions. Michael Paine at the City of Bellevue Planning and Community Development Department (Paine 2013) was contacted regarding City of Bellevue species of local importance. City of Lynnwood Development Director, Paul Krauss (Krauss 2012) was contacted regarding additional background reports to the City Comprehensive Plan. Chris Anderson at WDFW (Anderson 2013) was contacted regarding current data on nesting peregrine falcons and osprey in Bellevue. USFWS (2013) and WDFW (2012) databases were consulted for information regarding the presence of sensitive or protected wildlife and habitats.

Sound Transit will consult with the Muckleshoot Indian Tribe regarding treaty rights and the use of adjudicated usual and accustomed areas that provide the tribe with unique fishing, hunting, and gathering rights.

2.2.2.4 Vegetation Classification, Mapping, and Field Investigations

The system used to classify vegetation types within the study area was based on the accepted vegetation classification system used in the *East Link Project Final EIS* and related *Ecosystems Technical Report* (Sound Transit 2011), which was developed from the King County Wildlife Habitat Profile (1987).

Table 2-2 presents the vegetation types mapped within the four alternatives. Detailed descriptions of each vegetation community at each alternative site are presented in Section 3.2 of this report.

Other habitat types, such as streams and wetlands, were also mapped and are addressed in Sections 2.1 and 2.3. Each habitat type was given a habitat value rating of high, moderate, or low. These ratings should only be interpreted with respect to their relative value within the study area. For example, urban mostly vegetated coniferous habitat has more value to wildlife than urban moderately vegetated habitat, which has more value than urban sparsely vegetated habitat.

There are minor differences between the vegetation types used for the proposed project and those used in the *East Link Project Final EIS* (Sound Transit 2011). Sound Transit did not find urban, "moderately vegetated" areas with mowed lawns and an overstory of trees and shrubs within the build alternative sites; such areas were more prevalent in some of the areas assessed in the East Link FEIS. This was largely due to the prevalence of industrial and commercial development throughout the landscape of three of the four alternative sites. Similarly, "riparian," "blackberry," and "open water" were vegetation classifications used in the *East Link Project Final EIS* (Sound Transit 2011), but were not used in the current analysis. There is a general lack of riparian habitat within the study areas and although Himalayan blackberry is pervasive, it mainly occurs as understory in forested areas, or along edges between forested areas and development within the OMSF study areas. There is very little open water in any of the study areas.

Table 2-2. Vegetation Types and Associated Wildlife Habitat Value

Vegetation/Habitat Type[1]	Description	Habitat Value
Urban mostly vegetated – coniferous forest (UMVC)	Forest patches generally dominated by Douglas-fir with lesser amounts of black cottonwood, big-leaf maple, and red alder in the overstory. Occasionally red cedar is present. Canopy cover variable but generally greater than 40%. Douglas-fir trees mostly taller than 50 feet. Shrub layer often dominated by Himalayan blackberry but also includes salmonberry, snowberry, salal, Indian plum, rhododendron, and others.	High
Urban mostly vegetated – deciduous forest (UMVD)	Forest patches dominated by black cottonwood, big-leaf maple, willow, and red alder (40 to 70 feet tall), but with few conifers in the overstory. Canopy cover 40 to 80%. Understory tree cover may include big-leaf maple, black cottonwood, red alder, and Pacific madrone. Shrubs similar to those of coniferous forest type.	High
Urban mostly vegetated – mixed forest (coniferous/deciduous) (UMVM)	Areas with a more even mix of deciduous trees and conifers in the overstory. Shrubs similar to those of coniferous forest type.	High
Urban moderately vegetated (UMV)	Large native and ornamental trees (generally 40 to 70 feet tall) present, but with little to no understory; often planted in rows or adjacent to buildings. Some patches of ornamental and native shrubs may occur. Tree and shrub canopy cover values generally less than 30%.	Moderate
Urban sparsely vegetated (USV)	Commercial and industrial properties, road rights-of-way, and parking lots with a few or very small patches of ornamental and native trees; sparse grass cover and considerable human activities.	Low
Developed (D)	Paved areas of commercial and industrial activities and associated parking lots, including abandoned areas of asphalt and concrete.	Low

[1] Vegetation types were adapted from designations developed for the East Link study area by Sound Transit (2011) from the King County (1987) Wildlife Habitat Profile.

Wildlife habitat values were not attributed to each occurrence of a vegetation type, but instead were assigned to the vegetation type as a whole. Habitat value within a vegetation type at a specific location can vary and depends on several factors, such as size of the area; presence of (or proximity to) other valuable habitat; level and type of human disturbance; diversity of plant species; presence of multiple vegetation layers (i.e., tree, shrub, forb, and emergent layers); presence of threatened, endangered, or sensitive species; and extent of invasive weeds. The presence of potentially significant trees (as defined by the Lynnwood municipal code 17.15.080) and large areas of conifers that could form suitable habitat for Bellevue's designated species of local importance (per Bellevue LUC 20.25H.150A and B) were noted during the field reconnaissance, but the location of individual trees was not mapped.

Color aerial orthophotographs (i.e., aerial photographs adjusted for topography, lens distortion, and camera tilt) using a 1 inch = ~570 feet scale were created prior to the field reconnaissance to depict all areas within 500 feet of either side of the build alternatives. Vegetation type polygons within 200

feet of the boundary of each alternative site were then classified and mapped during the field reconnaissance and then digitized onto aerial photographs (scaled at approximately 1 inch = 120 feet) and then used to create GIS shapefiles and the figures in this report.

2.2.2.5 General Wildlife Habitat Value

All of the four alternative sites were assessed in the field by an experienced wildlife biologist. Some of the forested stands were not fully accessible due to a lack of private property access, thus, not all habitat could be thoroughly evaluated in the field. A qualitative wildlife habitat functional value assessment form was adapted from the Washington State Department of Transportation (WSDOT) *Wetland Functions Characterization Tool for Linear Projects* (WSDOT 2000) and was used in evaluating general wildlife habitat value in the study area. The template for the data form is provided in Appendix B. Completed forms are on file with Sound Transit. The qualitative functional value form assessed factors such as the following:

- Relative vegetation density, age, and growth form, and species and structural diversity;
- Dominant plant species composition;
- Location relative to sources of human disturbance;
- General levels of development in the vicinity of the site;
- Connectivity to other areas of valuable wildlife habitat;
- Presence of movement barriers;
- Presence of water and, if present, water type; and
- Specific habitat elements (snags, down wood, rocks, leaf litter, etc.)

These qualitative wildlife habitat assessment forms were not completed for wetlands. A wetland-specific functional assessment form was used for wetlands which assesses wildlife habitat function as a specific component of a wetland's functions (Section 2.3, Wetland Resources). The results of the field reconnaissance and wetland functional assessment were used to identify important wildlife habitats associated with wetlands. These data were used to supplement information received from WNHP and WDFW, which covered both upland and wetland-associated wildlife species.

2.2.2.6 Impact Analysis

Potential impacts from the construction and operation of each alternative on vegetation and wildlife habitat were quantitatively determined by evaluating the acreage of major vegetation types that would be permanently or temporarily affected by each alternative. Acres of impact were determined using GIS based analysis of the proposed project and construction limits of each alternative. Impacts were also determined qualitatively, based on factors, such as the regional significance of the habitat, its value (such as a site's role as a wildlife movement corridor), the degree of fragmentation and loss of the habitat following project implementation, overall habitat quality, and the potential for enhancing or restoring unique plant communities or wildlife habitat or connectivity.

Temporary construction and permanent operational impacts on wildlife, including disturbances from increases in human access, noise, and light were also evaluated. The potential for the introduction and/or removal of noxious and/or invasive species as a result of the proposed project were also evaluated.

2.3 Wetland Resources

2.3.1 Wetland Resources Study Objectives

The background data review indicated that wetlands could be located within the project limits of each of the four alternatives. As a result, specific objectives of this analysis included:

- Cataloging the existing conditions of all potential wetlands and wetland buffers located within 200 feet of all sides of each alternative, including relative degree of wetland functions;
- Determining each alternative's temporary construction and permanent operational impacts on all potential wetlands; and
- Describing measures to avoid, minimize, and mitigate for impacts.

2.3.2 Wetland Resources Methods

Potential wetlands were identified through existing mapping inventories and published documents, field reconnaissance, and communications from various agencies. Federal, state, and local regulations were referred to assist in classifying and rating wetlands and to ensure reconnaissance methods and subsequent wetland rating and buffer determination were consistent with existing laws.

2.3.2.1 Review of Existing Information

Sound Transit conducted a review of existing literature and data to identify and characterize potentially affected wetlands in and near the project area. Existing documentation and information were compiled and reviewed first so that the field reconnaissance effort could focus on verifying data and filling information gaps.

Existing wetland data were gathered from a variety of sources—including federal, state, and local agencies—reviewed in the office, and then evaluated in the field during a one-day reconnaissance in which all four build alternative sites were visited.

Existing GIS information illustrating previously inventoried wetlands (and streams) relative to the Lynnwood Alternative site was obtained from the USFWS National Wetland Inventory (NWI), Snohomish County, the 2006 Lynnwood Environmentally Sensitive Areas map, and the WDFW Salmon and Steelhead Habitat Inventory and Assessment Project (SSHIAP).

Existing GIS information illustrating previously inventoried wetlands (and streams) relative to the three alternative sites in Bellevue was obtained from the USFWS NWI, the King County iMap interactive mapping website, the SSHIAP, from a link on the City of Bellevue website to the NWmaps.net, and from the Bellevue Shoreline Master Program Wetlands and Streams map (City of Bellevue 2007b). The NWmaps.net interactive maps include an Environmental layer which displays information regarding streams, wetlands, steep slope, and 'other hazard areas'.

In addition, the *East Link Project Final EIS* and *Ecosystems Technical Report* (Sound Transit 2011) and the *Lynnwood Link Extension Draft EIS* and *Draft Ecosystems Technical Report* (Sound Transit 2013) were also reviewed for the location and description of wetlands inventoried near each of the alternative sites. Wetland boundaries and the location and extent of potential wetlands as determined by Sound Transit during preparation of the *Lynnwood Link Extension Draft EIS* and *Draft*

Ecosystems Technical Report (Sound Transit 2013) were incorporated into the findings herein. Surveyed wetland delineations recently completed for permitting of East Link were incorporated herein, and these boundaries were ultimately used to determine potential wetland and wetland buffer impacts from the proposed build alternatives.

2.3.2.2 Agency Coordination

Sound Transit contacted the Cities of Bellevue and Lynnwood and Snohomish County regarding their wetland inventories. Locally inventoried wetland data was not provided by Bellevue or Lynnwood. Rather, city representatives referred inquiries regarding previously inventoried wetlands and streams to on-line resources available from Snohomish County, King County, the NWI, and NWmaps.net.

2.3.2.3 Wetland Determination

Sound Transit conducted a field reconnaissance of all study areas to determine if the study area appears to support potential wetlands, streams, and other regulated waters of the U.S. (such as ditches) on December 5, 2012 and conducted a limited follow-up visit on January 31, 2013 to portions of the SR 520 Alternative and BNSF and BNSF Modified Alternatives. Sound Transit used aerial photographs from 2011/2012 available from Google Earth and to evaluate existing mapped wetlands and to help pinpoint potential additional wetlands that were not included in any of the wetland maps or inventories.

To determine whether wetlands could be present, existing wetland and soils series data were plotted onto the aerial photograph map books created for the proposed project, and the alternatives were then added to the map books with 500-foot boundaries from the outer edges of the alternative footprints illustrated. Sound Transit carefully examined a wetlands study area of 200 feet on all sides of the build alternatives to locate any potential wetland resources that might have been omitted from the existing wetland inventories and maps and that might have regulatory buffers that intersect the study area.

Wetlands described also include those wetlands that are partly within or cross through the study area. Portions of wetlands that extend beyond the field reconnaissance survey area and other potential wetlands outside of the field reconnaissance survey area were identified based on visual observation from public areas during the field reconnaissance; current local, state, and federal wetland maps; critical area reports; and aerial photograph examination. These areas outside of the field reconnaissance survey area that appear to possess all three wetland indicators are included in this study.

The field investigation was based on the routine-level wetland delineation methods outlined in the *1987 Corps of Engineers Wetland Delineation Manual* (i.e., the '1987 Manual') (U.S. Army Corps of Engineers 1987), as updated by the *2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region*, referred to herein as the Regional Supplement (U.S. Army Corps of Engineers 2010), and the *Washington State Wetlands Identification and Delineation Manual* (Washington State Department of Ecology 1997). Both manuals and the Regional Supplement require the presence of wetland indicators for hydrophytic vegetation, hydrology, and hydric soils for an area to be considered a wetland.

However, since there was no private property access granted, data regarding dominant vegetation, slope and topography and general site conditions were collected entirely from Sound Transit owned

property, road rights-of-way and other publically accessible areas and were based on what could be visually observed from such vantage points. Consequently, standard wetland data plots were not collected, and thus the presence or absence of hydric soils and in some cases wetland hydrology could not be definitively determined. Thus, wetland boundary delineations were generally not conducted as part of this effort. Rather, wetlands were determined based on the observation of a dominance of hydrophytic vegetation, the presence of observable soil saturation or ponding, the mapped soil series, and indicators such as geomorphic position (e.g., in a depression or adjacent to a stream), evidence of water flow pathways, and evidence of erosion by flowing water.

In addition, Sound Transit also identified several 'potential' wetlands by visual observation from public areas during the field reconnaissance; review of current local, state, and federal wetland maps; and review of critical area report figures or plans completed during preparation of the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013). Boundaries of these 'potential' wetlands were added to the GIS database by incorporating GIS layers prepared by Sound Transit as part of the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013). After the field investigations were completed, all wetlands were added into the project database and identified on project maps.

The 2006 annotated version of the 2004 *Washington State Wetland Rating System for Western Washington* (Washington State Department of Ecology publication #04-06-025) (Hruby 2006) was used to determine the hydrogeomorphic class and likely regulatory category of all wetland features identified in the study area.

The exception to this visual reconnaissance method was the incorporation herein of the wetlands delineated and surveyed by Sound Transit for the East Link (South Bellevue to Overlake) project that were located within the BNSF Storage Yard component of the Lynnwood Alternative, the BNSF and BNSF Modified Alternatives, and SR 520 Alternative. These wetlands appear on all project maps as delineated wetlands, distinct from the more approximate wetland boundaries determined based on visual reconnaissance and background review. The description, hydrogeomorphic class, and regulatory category of the wetlands delineated for the East Link project was derived from the project's draft final wetland delineation report (Anchor Environmental 2013).

Once a preferred alternative is selected, Sound Transit will complete wetland delineations and have jurisdictional determinations completed by the Corps for all wetlands within the boundary of the preferred alternative.

Soils

To help locate potential wetland sites, Sound Transit used mapped soil series data obtained from the USDA NRCS) (U.S. Department of Agriculture 2012) and soil series descriptions from the Snohomish County Soil Survey (Debose and Klungland 1983) and the King County Soil Survey (Snyder et al. 1973) to create mapbooks illustrating the different soil boundaries and soil types within the study area. The hydric soil lists for Snohomish and King Counties were used to determine if the mapped soil types are classified as hydric or nonhydric soils (U.S. Department of Agriculture 2001). It should be noted however that wetlands can occur within areas mapped as nonhydric soil series and that areas mapped as hydric soil can contain nonwetland areas.

Soil survey information was used during the field reconnaissance as a potential indicator of the presence of wetlands. However, during a visual reconnaissance without property access, soil pits cannot be dug to determine if soil conditions meet hydric soil criteria. Soil classifications and descriptions were determined from the county soil survey but these documented conditions could

not be compared with field samples. Information such as soil saturation or surface ponding, in areas immediately adjacent to publically accessible roadways/rights-of-way was documented. A dominance of hydrophytic vegetation (or lack thereof) was used as an indicator of potential hydric soil conditions and thus to make a reconnaissance-level determination of the location and extent of potential wetland conditions.

Vegetation

Plant communities were evaluated in December 2012 and January 2013 in portions of the SR 520 Alternative and BNSF and BNSF Modified Alternatives to determine the presence and dominance of hydrophytic vegetation. Deciduous and herbaceous species were dormant during this time of year, so deciduous shrubs and trees were identified by buds, leaf scars, bark, branch growth patterns, and fallen leaves around the base of the plant. Herbaceous vegetation was identified by last year's growth, which was still evident on most species. During a visual reconnaissance, a list of dominant, observable species is compiled as an indicator of the potential for an area to meet the criteria for wetland vegetation, but such data is inherently limited to the largest, most readily visible species (generally trees and shrubs and large herbaceous species such as vines and ferns). A dominance of hydrophytic vegetation (or lack thereof) was used to make a reconnaissance-level determination of the location and extent of potential wetlands in the study area. Hydrophytic vegetation exists when more than 50% of the dominant plants in each strata (i.e., tree layer, shrub layer, and/or herb layer) are either obligate, facultative wetland, or facultative indicator plants (Table 2-3). Wetland indicator status was determined using the Western Mountains, Valleys, and Coast 2012 Final Regional Wetland Plant List (U.S. Army Corps of Engineers 2012).

Table 2-3. Wetland Plant Indicator Status

Indicator Status	Indicator Symbol	Wetland Definition
Obligate Wetland Plants	OBL	Plants that occur almost always (estimated probability >99%) in wetlands under natural conditions, but which might also occur rarely (estimated <1%) in nonwetlands
Facultative Wetland Plants	FACW	Plants that occur usually (estimated probability >67 to 99%) in wetlands, but which also occur (estimated probability 1 to 33%) in nonwetlands
Facultative Plants	FAC	Plants with a similar likelihood (estimated probability33 to 67%) of occurring in wetlands and nonwetlands
Facultative Upland Plants	FACU	Plants that occur sometimes (estimated probability 1 to <33%) in wetlands, but which occur more often (estimated probability >67 to 99%) in nonwetlands
Obligate Upland Plants	UPL	Plants that occur rarely (estimated probability <1%) in wetlands, but occur almost always (estimated probability >99%) in nonwetlands under natural conditions

Source: U.S. Army Corps of Engineers 2012.

Hydrology

The hydrology of each site was also evaluated during December 2012. Signs of water were followed toward their sources where possible from public access points. Secondary indicators of wetland hydrology, including water-stained vegetation, erosion patterns, and debris dams, were noted. Aerial maps were used to determine the water sources and where to extend the search.

During a visual reconnaissance without property access, soil samples cannot be obtained to determine if soil saturation or free water within 12 inches of the surface is present if such conditions are not readily apparent through visual observation. Consequently, a dominance of hydrophytic vegetation (or lack thereof) was used as an indicator of areas that could have wetland hydrology (if it was not readily apparent) and was used to make a reconnaissance-level determination of possible wetland conditions.

2.3.2.4 Wetland Functions and Classification

Wetlands were classified following federal and state guidelines. The Cowardin system (Cowardin et al., 1979) was used to define and describe the vegetation characteristics of wetlands in the study area (Table 2-4). In addition, the Hydrogeomorphic Classification (HGM) (Brinson 1993) for each wetland was ascertained using guidance found in the *Washington State Wetland Rating System for Western Washington Revised* (Hruby 2006). The HGM classification system breaks wetlands down into categories based on their hydrodynamics, hydrologic source, and geographic setting (such as depressional, riverine, or slope).

Table 2-4. Cowardin Classifications of Wetlands Located within the Wetlands Study Area

Cowardin Classification	Definition
Palustrine Emergent (PEM) and Riverine Emergent (REM)	Vegetation standing in a few inches to 1 meter (3 feet) of water, dominated by erect rooted herbaceous freshwater hydrophytic vegetation. Riverine emergent areas are associated with the movement of water through a defined stream channel and periodic overbank flooding.
Palustrine Scrub-Shrub (PSS)	Areas dominated by woody vegetation <6 meters (20 feet) tall. Woody shrub component consisting of shrubs and small trees.
Palustrine Forested (PFO) and Riverine Forested (RFO)	Areas dominated by woody vegetation >6 meters (20 feet) tall. Riverine forested areas are associated with the movement of water through a defined stream channel and periodic overbank flooding.

The *Washington State Wetland Rating System for Western Washington Revised* (Hruby 2006) was used to determine the category of each wetland based on the wetland's opportunity and potential to perform societally important functions. The rating system has been adopted by Lynnwood and Bellevue and incorporated into their CAOs as the method to determine a wetland's regulatory category and thus its buffer and related mitigation requirements for unavoidable impacts on the wetland. Higher quality functions result in higher ratings, with Category 1 being the highest functioning wetlands and Category 4 the lowest. Wetland-buffer width varies with a given wetland category, which also varies with the specific jurisdiction (Table 2-5). Wetland buffers are not given their own regulatory category but are typically regulated as a critical area.

Once the wetland category was determined, the appropriate wetland buffer was added to the mapped configuration of each wetland area to display the total wetland footprint (including both wetland and buffer) occurring within the construction limits of each alternative. In many cases, existing buildings, parking lots, railroad tracks and ballast, and roads are currently located within wetland buffer areas and reduce buffer functions under existing conditions. Thus, the functional (i.e., nondeveloped) buffer of each wetland was considered during assessment of potential impacts.

Table 2-5. Wetland Categories and Buffer Requirements for Wetlands Located in the Project Study Area

Classification System	Wetland Category	Buffer Requirements[a,b]
City of Bellevue[b]	Category 1:	75–225 feet
	Category 2:	75–225 feet
	Category 3:	60–110 feet
	Category 4:	40 feet with no setback
City of Lynnwood[c]	Category 1:	75–225 feet
	Category 2:	75–225 feet
	Category 3:	50–110 feet
	Category 4:	25–50 feet

[a] Variations in buffer width are due to functional scores and other criteria used by each jurisdiction.
[b] All Category 1, 2, and 3 Wetlands in Bellevue have a 20-foot setback that prohibits placement of any structure within 20 feet of the wetland boundary.
[c] All wetlands in Lynnwood have a 15 foot setback for buildings.

2.3.2.5 Wetland Functional Assessment

The functions and values that exist in each wetland and their level of performance were qualitatively evaluated during the site visits. The presence and quality of functions provided by each wetland resource were assessed using the *Washington State Wetland Rating System for Western Washington Revised* (Hruby 2006). The rating system defines three main wetland functional categories (i.e., hydrologic, water quality, and habitat). The wetland rating scores for each function group were then also converted into general groups (low, moderate, or high) according to the *Focus Sheet: Using the Wetland Rating System in Compensatory Mitigation* (Washington State Department of Ecology 2008) for use in assessing impacts and appropriate mitigation for lost functions.

2.4 Waters of the United States

Sound Transit investigated the study area for potentially jurisdictional ditches, which may be regulated by the Corps as waters of the U.S. based on the June 5, 2007, regulatory guidance letter No. 07-01 issued by the Corps and the U.S. Environmental Protection Agency (EPA). The reconnaissance focused on features that might satisfy the criteria for 'significant nexus' to a traditional navigable water (per the U.S. Supreme Court *Rapanos* decision of 2006) and thus create conditions in which the Corps would assert Clean Water Act jurisdiction, such as: conveyance of water directly from a wetland tributary to a navigable waterway and/or support of wetland vegetation indicative of 'relatively permanent flow' (i.e., defined as more than 3 months per year).

Drainage ditches used as part of an approved public storm drainage system are not typically regulated as wetlands by Bellevue or Lynnwood, but may still be regulated as waters of the U.S. by the Corps under such conditions.

During a visual reconnaissance without property access, visual observations of slope, bed and bank scour, erosion, water flow, and flattened vegetation, and the presence of upstream or downstream wetlands in areas immediately adjacent to publically accessible roadways/rights-of-way were used to determine the presence of potentially regulated ditches in the study area.

Once a preferred alternative is selected, Sound Transit will complete field delineations and have jurisdictional determinations completed by the Corps for all wetlands and ditches within the boundary of the preferred alternative. The Corps (with oversight by EPA) makes the ultimate decision as to the jurisdictional nature of ditches.

Chapter 3
Affected Environment

The proposed project would be constructed in a generally urban area with variable levels of existing human activity. All four build alternatives occur adjacent to one or more heavily traveled highways (I-405, I-5, and/or SR 520). All contain a mix of commercial development, with streams, wetlands, and/or upland vegetation. This chapter describes the affected environments for aquatic resources (Section 3.2), vegetation and wildlife resources (Section 3.3), and wetland resources (Section 3.4) at each of the build alternative sites.

3.1 Regulatory Context

Title 21A of Washington state's Growth Management Act (GMA) requires counties and cities in Washington to designate and protect critical areas in accordance with RCW 36.70A.170. The GMA requires best available science be used in developing policies and regulations to protect critical area functions and values. Critical areas include wetlands, critical recharge areas for potable water aquifers, frequently flooded areas, geologic hazard areas, and fish and wildlife habitat conservation areas. The Cities of Bellevue and Lynnwood created critical areas ordinances to meet the requirements of the GMA and ensure the management and protection of lands used by listed and locally important species.

Critical areas are regulated under Title 20 of the Bellevue Land Use Code (LUC) via Part 20.25H, the Critical Areas Overlay District. Critical areas are designated as per Bellevue LUC 20.25H.025 and include streams, wetlands, shoreline, geological hazard areas, habitats associated with species of local importance, and areas of special flood hazard.

Critical areas are regulated under Title 17 of the Lynnwood Municipal Code (LMC) via Part 17.10, Environmentally Critical Areas. Critical areas are designated as per Lynnwood LMC 17.10.030 and include wetlands, streams, fish and wildlife priority habitat, and geologically hazardous areas, as well as 'any additional areas defined or established as critical areas under the provisions of the Washington State Growth Management Act or the provisions of [the] chapter'.

The provisions of these regulations relevant to aquatics, vegetation, wildlife, and wetlands are summarized below.

3.1.1 Aquatic Resources

Title 20.25H of the Bellevue LUC designates ecologically sensitive habitat for protection during development, which includes aquatic habitat such as streams, wetlands, and shorelines. The ordinance also designates habitat associated with fish species of local importance as critical areas. These species are: bull trout, river lamprey, and Chinook and coho salmon. With the likely exception of bull trout, which are not known to occur in any project area streams, these species occur in streams already protected as critical areas by the code (Bellevue LUC 20.25H.075). Where habitat for species of local importance occurs outside of another critical area, compliance with WDFW species management plans is required (Bellevue LUC 20.25H.150.B).

Stream buffer requirements for streams are also included as critical areas (Bellevue LUC 20.25H.075.C), although these provisions are less stringent for previously developed sites, compared to undeveloped sites. As the proposed build alternative sites in Bellevue are currently developed sites, these less stringent provisions would apply. For example, stream buffer requirements are substantially lower for the build alternative sites than if these sites were previously undeveloped (Table 2-1).

For Lynnwood, Chapter 17.10.030 of the LMC designates environmentally critical areas, to protect areas essential to preserving the natural environment, and protecting the public's health and safety. These include wetlands, streams, and fish and wildlife priority habitat areas. Streams are regulated as critical areas by stream category. Use by salmonids is a criterion in defining the difference between a Category II and Category III stream (LMC 17.10.060). Fish and wildlife priority habitat can also include uplands when they provide 'essential habitat' for the survival of species listed as threatened or endangered under the federal or state endangered species acts, federal candidate species or species of concern, and state candidate or sensitive species (LMC 17.10.030 and 17.10.080D).

3.1.2 Vegetation and Wildlife

Title 20.25H of the Bellevue LUC designates certain wildlife as species of local importance and designates their associated habitat as critical areas (Bellevue LUC 20.25H.150A and B). The wildlife species are: bald eagle, peregrine falcon, common loon, pileated woodpecker, Vaux's swift, merlin, purple martin, western grebe, great blue heron, osprey, green heron, red-tailed hawk, western big-eared bat, Keen's myotis, long-legged myotis, long-eared myotis, Oregon spotted frog, western toad, and western pond turtle. Many of these species occur in wetlands and streams already protected as critical areas by the code (Bellevue LUC 20.25H.075 and 20.25H.095). Where habitat for species of local importance occurs outside of another critical area, compliance with WDFW species management plans is required if impacts are proposed to the habitat.

Fish and wildlife priority habitat is defined in Lynnwood as Category I and II wetlands, Category I streams, Category II streams if used by salmonids, and upland areas that contain 'essential habitat' for certain listed species (as defined in LMC 17.10.030 and 17.10.080D). Essential habitat is defined as "habitat necessary for the survival of species listed as threatened or endangered under the Federal Endangered Species Act, species listed as threatened or endangered by the Washington State Department of Fish and Wildlife, species listed as candidate or species of concern by the U.S. Fish and Wildlife Service or NOAA Fisheries, and species listed as sensitive or state candidate by the Washington State Department of Fish and Wildlife." Fish and wildlife priority habitat in Lynnwood also includes upland areas contiguous with large blocks of distinct habitat extending outside of the city limits or providing a travel corridor to a significant resource, and areas adjacent to or contiguous with Category I wetlands which enhance the value of those wetlands for wildlife (LMC 17.10.080D).

3.1.3 Wetlands

Wetlands are defined as a critical area in Bellevue, per Bellevue LUC 20.25H.025 and 20.25H.095 and their regulatory category (Category I, II, III, or IV) is determined based on the *Washington State Wetland Rating System for Western Washington Revised* (Hruby 2006), as per Bellevue LUC 20.25H.095.B. Wetland buffer widths are based on wetland category and the wetland's characteristics and habitat points per the *Washington State Wetland Rating System for Western*

Washington Revised (Hruby 2006). Wetland buffers on sites with existing, structures legally established before August 1, 2006 are modified to exclude the footprint of the primary structure. Expansion of any such structures is subject to critical area review requirements, including buffer modification requirements (Bellevue LUC 20.25H.095.C.1b).

Compensatory mitigation to replace the acreage and function of wetlands proposed for impact is required (Bellevue LUC 20.25H.105.C), including demonstration of all measures used to avoid, minimize, and appropriately mitigate for impacts, and how all applicable performance standards outlined in Bellevue LUC 20.25H.055 are being met.

Wetlands are defined as a critical area in Lynnwood, per LMC 17.10.030 and their regulatory category (Category I, II, III, or IV) is determined based on the *Washington State Wetland Rating System for Western Washington Revised* (Hruby 2006), as per LMC 17.10.050.E. Wetland buffer widths are based on wetland category and are established using three factors: the wetland category; the intensity of impacts; and the functions or special characteristics of the wetland that need to be protected, as determined through the rating system.

All wetlands and wetland buffers are to be preserved unless a project applicant can demonstrate there is no feasible and reasonable alternative to the proposed impacts, the alteration will preserve, improve, or protect the functions of the wetland system; or the mitigation proposed for such alteration has a high probability of success (LMC 17.10.052). Measures to minimize the impacts of the land use adjacent to the wetlands are also to be applied (LMC 17.10.051).

3.2 Aquatic Resources

The project limits under each of the four alternatives have all experienced a moderate to high degree of alteration to aquatic and riparian habitats. The degree of alteration varies from water body to water body, with the greatest alteration occurring where urban development is the greatest, such as some of the tributaries to Kelsey Creek in Bellevue within the vicinity of the BNSF Alternative, BNSF Modified, and SR 520 Alternatives and the BNSF Storage Tracks portion of the Lynnwood Alternative site. Some of the smaller streams and headwater reaches such as Goff Creek have been placed in long pipe systems, or narrow corridors, confined by parking lots and commercial developments. Both Goff Creek and West Tributary to Kelsey Creek have fish passage barriers that prevent anadromous fish from reaching portions of the streams that could be directly affected by the proposed project actions. A small portion of the SR 520 Alternative is in the Valley Creek drainage, which is accessible to anadromous fish.

Scriber Creek in Lynnwood is also located in an urbanized setting, although the Lynnwood Alternative site is adjacent to an urban green belt with an extensive wetland complex associated with Scriber Creek. Scriber Creek also has fish passage barriers that at least partially prevent anadromous fish use of the stream reach in the vicinity of the Lynnwood Alternative site (Washington Department of Fish and Wildlife 2013).

3.2.1 Drainage System Configuration

The Lake Washington Watershed (i.e., WRIA 8) is composed of two major subbasins: the Sammamish River and the Cedar River. Table 3.2-1 and Table 3.2-2 list the water bodies that could be potentially affected by the proposed project and their state and local classifications and associated buffer requirements.

Table 3.2-1. Water Bodies in the Vicinity of the Build Alternatives

	Lynnwood Alternative (including BNSF Storage Tracks component in Bellevue)	BNSF Alternative	BNSF Modified Alternative	SR 520 Alternative
Scriber Creek	X			
Swamp Creek	X			
West Tributary of Kelsey Creek	X	X	X	
Kelsey Creek	X	X	X	X
Lake Bellevue	X	X	X	
Sturtevant Creek	X	X	X	
Goff Creek				X
Valley Creek				X
Unnamed Tributary 0265N				X

The Lynnwood Alternative site occurs in the Scriber Creek drainage of the Swamp Creek sub-basin, which discharges into the Sammamish River and then into the north end of Lake Washington. Figure 3.2-1 shows the water bodies in and around the Lynnwood Alternative study area.

The other three build alternative sites (BNSF, BNSF Modified, and SR 520), as well as the BNSF Storage Tracks component of the Lynnwood Alternative, occur in the Kelsey Creek subbasin, which discharges into Mercer Slough and then into Lake Washington, south of Bellevue (Figure 3.2-2).

The Lynnwood Alternative site is entirely within the 4,250-acre Scriber Creek subbasin. The surface water resources within the study area of this site include a large wetland complex to the north (herein described as Wetland N-1), and Scriber Creek, which flows through this wetland (Figure 3.2-1). Upstream of this wetland and the Lynnwood Alternative site, the stream exhibits characteristics typical of urbanized streams, including straightened and unstable channels with extensive riprap armored banks, narrow riparian corridors, and increased impervious surface area (Table 3.2-3).

About 39% of the Scriber Creek watershed consists of impervious surface areas, and basins with over 26% impervious surface are typically considered to provide poor habitat to support fish species (Schueler 1994). Urban streams also typically have fair to poor water quality and poor biological diversity. The reach adjacent to the Lynnwood Alternative site, as well as for about 0.5 mile downstream of the I-5 culvert, is much less characteristic of an urbanized stream. In this reach, the stream bounded by large wetland complexes that provide extensive riparian vegetation, within a wide channel migration floodplain. The stream has limited bank armoring and impervious surface areas within the floodplain.

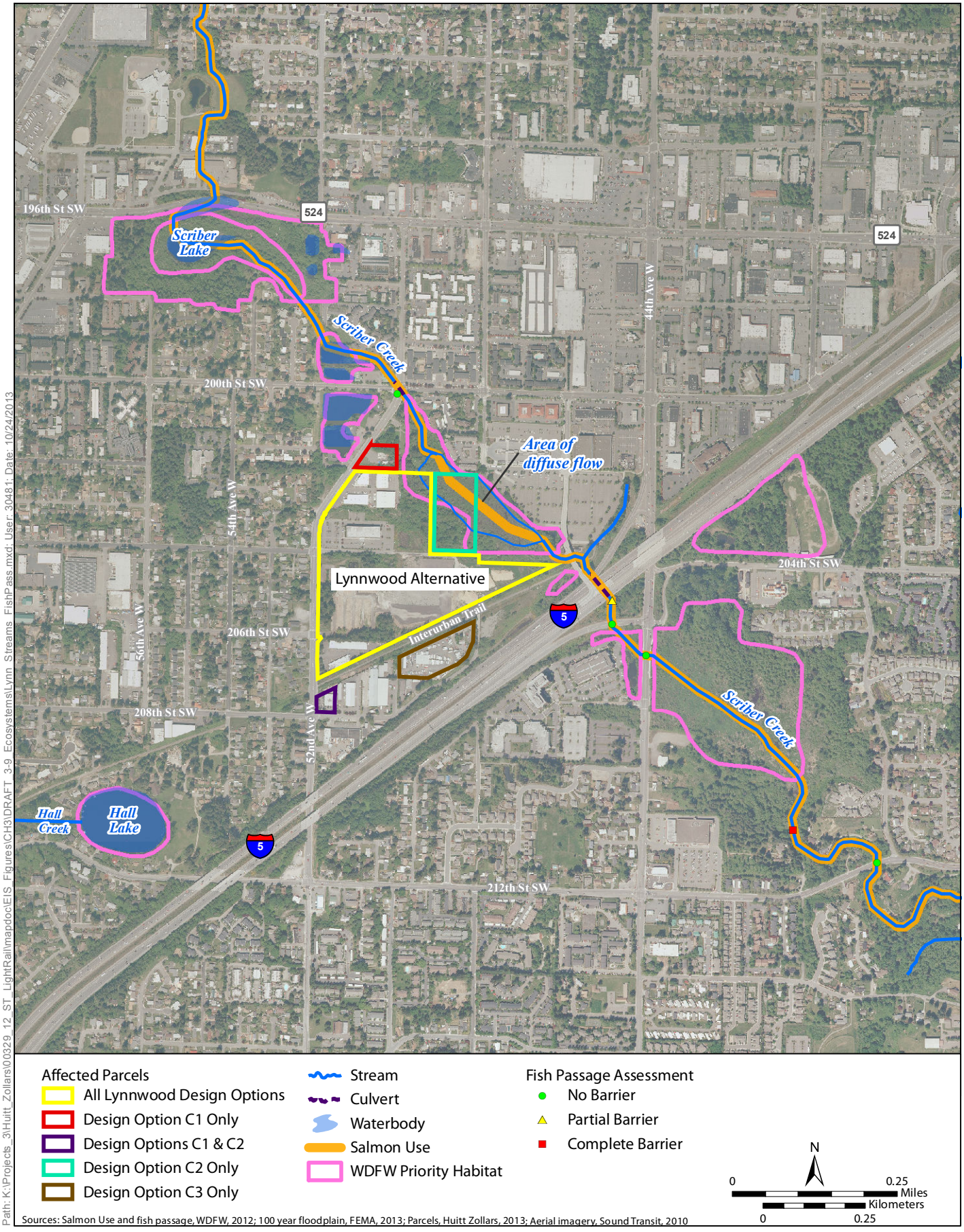

Figure 3.2-1: Streams, Fish Passage Features, and WDFW Priority Habitat—Lynnwood Ecosystems Technical Report

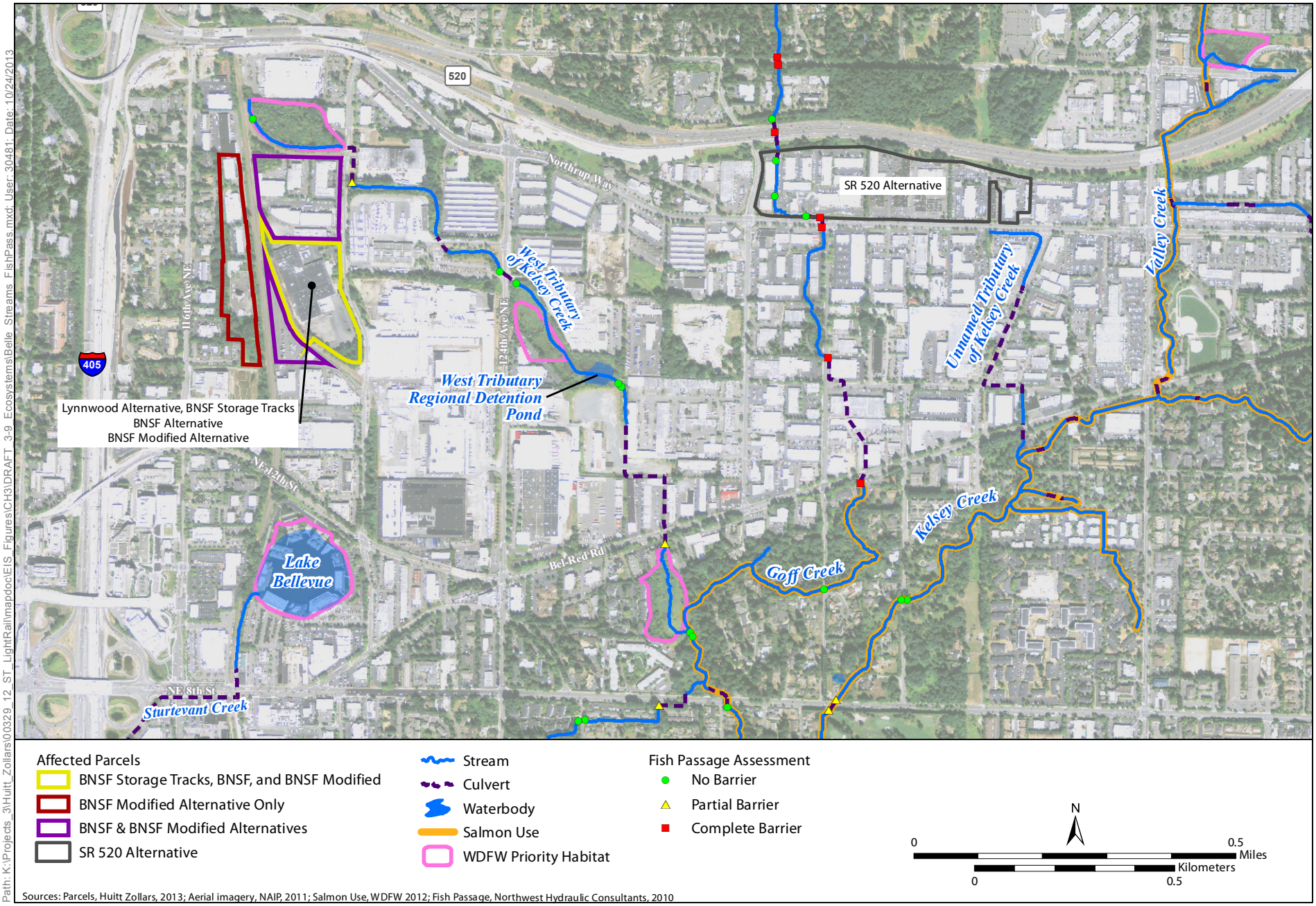

Figure 3.2-2: Streams, Fish Passage Features, and WDFW Priority Habitats—Bellevue
Ecosystems Technical Report

Table 3.2-2. Study Area Streams, State and Local Classifications, and Buffer Requirement

Stream	WAC 222-16-031 Interim Water. Typing	Bellevue	Lynnwood	Stream Buffer
Kelsey Creek[a]	Type 2	Type F	-	100
West Tributary of Kelsey	Type 2	Type F	-	50
Goff Creek	Type 2	Type F	-	50
Valley Creek	Type 2	Type F	-	50
Sturtevant Creek (headwaters)	Type 5	Not rated	-	-
Swamp Creek	Type 2	-	Category I	100
Scriber Creek	Type 2	-	Category I	100

[a] The Kelsey Creek/Mercer Slough complex is rated Type 1/Type S, however, the remainder upstream channel segments are rated Type 2/Type F or lower, including the reaches within the vicinity of the study area.

- Type 1/Type S: all waters, within their ordinary high-water mark, are inventoried as "shorelines of the state" under chapter 90.58 RCW and the rules promulgated pursuant to chapter 90.58 RCW.
- Type 2/Type F/Category 1: segments of natural waters which are not classified as Type 1 Water and have a high fish, wildlife, or human use and/or are significant for protection of downstream water quality.
- Type 5/(not rated): seasonal, nonfish habitat streams in which surface flow is not present for at least some portion of the year and are not located downstream from any Type 4 Water. Type 5 Waters must be physically connected by an above-ground channel system to downstream Type 1, 2, 3, or 4 Waters

Surface water resources in the immediate vicinity of the three alternative sites in Bellevue include five streams, a pond, and two regional water treatment facilities that support wetland vegetation (Figure 3.2-2). These facilities are not within the build alternative sites and are thus not described herein. All of these resources exhibit characteristics typical of urbanized environments, including increased levels of impervious surface area (Table 3.2-3), which range from 30% to 71%, including 28% to 62% impervious surface area within the 100-foot stream buffer (City of Bellevue 2010b).

Table 3.2-3. Total Basin Area and Percent Impervious Surface in Basins and Stream Buffers of the Water Bodies in the Vicinity of the Build Alternatives

	Total Basin Area (acres)	Percent Impervious Surface in Basin	Percent Impervious Surface within Stream Buffer
Scriber Creek	4,250	39	NA
Swamp Creek	15,800	52	NA
West Tributary of Kelsey Creek	1,006	46	28
Kelsey Creek	2,822	40	17
Sturtevant Creek	773	71	62
Goff Creek	674	30	35
Valley Creek	1,391	34	20

Source: City of Bellevue 2010b.

3.2.2 Fish and Aquatic Habitat

This section describes the aquatic species and habitat within the study area of each build alternative, all of which occur in the Lake Washington watershed.

3.2.2.1 Lake Washington Watershed

Lake Washington is the second largest lake in Washington, at about 20 miles in length and an average of about 1.5 miles wide, with a surface area of about 22,138 acres. The major sources of water that enter the lake are the Cedar River (55% of the average inflow) and the Sammamish River (27% of the average inflow). The remainder of inflow comes from a number of smaller tributaries and drainages, such as May Creek, Kelsey Creek, Juanita Creek, Thornton Creek, and Lyon Creek. The lake drains to Puget Sound through the Lake Washington Ship Canal and the Hiram Chittenden (Ballard) Locks, which were constructed around 1916. Prior to this construction, the outlet was at the south end of the lake, through the Black River to the Green River and then to Elliott Bay. At that time, the Cedar River discharged into the Black River, instead of Lake Washington.

Many species of resident fish, both native and introduced, inhabit Lake Washington (Table 3.2-4). Several species of introduced fish are very abundant in the lake, such as yellow perch and smallmouth bass.

The most abundant species typically occurring in the tributary streams to Lake Washington are salmonids. Five species of anadromous salmonids are native to the Lake Washington Watershed (Kerwin 2001), kokanee, Chinook, and coho salmon, steelhead/rainbow trout, and coastal cutthroat trout (both anadromous and resident forms) (Table 3.2-4). Sockeye salmon are currently the most abundant salmonid in the watershed. This species may have been present in the watershed historically but is now heavily supplemented by hatchery production in the Cedar River. Steelhead, coho, and Chinook populations have declined substantially since the 1980s and 1990s (Kerwin 2001). Steelhead are currently at a critically low abundance level throughout the watershed (Washington Department of Fish and Wildlife 2013). Pink salmon are occasionally observed in Lake Washington tributaries, but these individuals are likely strays and not part of an established population (Hard et al. 1996). Chum salmon are also occasionally observed, however there are no self-sustaining chum salmon populations in this subbasin (Johnson et al. 1997).

Sockeye salmon rear extensively in the lake as juveniles, typically for about one year, and occupy the lake for several months as returning adults (from about June to September), before returning to their natal streams to spawn. The primary spawning areas are in the Cedar River, Issaquah Creek, and Bear Creek, but substantial numbers also use nearly all of the larger tributary streams, including Kelsey and Swamp creeks, downstream of the proposed project areas. Juveniles enter the lake as fry during late winter and early spring, and most rear in the lake for one year. Sockeye smolts leave the lake in spring to enter Puget Sound, and then migrate to the open ocean. In addition, to anadromous sockeye, a resident form (kokanee), also occur in the system. Kokanee, adults spawn in many of the same areas as sockeye, but the juveniles only migrate downstream as far as the lake, where they mature to adults (Kerwin 2001).

Table 3.2-4. Fish Species Commonly Found in Lake Washington

Common Name	Scientific Name	Origin
Summer/fall Chinook salmon	*Oncorhynchus tshawytscha*	Native with hatchery influence
Sockeye salmon/kokanee	*Oncorhynchus nerka*	Native/introduced with hatchery influence
Coho Salmon	*Oncorhynchus kisutch*	Native with hatchery influence
Steelhead/rainbow trout (anadromous and resident)	*Oncorhynchus mykiss*	Native
Cutthroat trout (anadromous and resident)	*Oncorhynchus clarki*	Native
Northern pikeminnow	*Ptychocheilus oregonensis*	Native
Rocky Mountain whitefish	*Prosopium williamsoni*	Native
Peamouth	*Mylocheilus caurinus*	Native
Large-scale sucker	*Catostomus macrocheilus*	Native
Coast range sculpin	*Cottus aleuticus*	Native
Prickly sculpin	*Cottus asper*	Native
Riffle sculpin	*Cottus gulosus*	Native
Three-spined stickleback	*Gasterosteus aculeatus*	Native
Longfin smelt	*Spirinchus thaleichthys*	Native
Pacific lamprey	*Entosphenus tridentatus*	Native
Brook lamprey	*Lampetra planeria*	Native
River lamprey	*Lampetra fluviatilis*	Native
Redside shiner	*Richardsonius balteatus*	Native
American shad	*Alosa sapidissima*	Introduced (nonnative)
Largemouth bass	*Micropterus salmoides*	Introduced (nonnative)
Smallmouth bass	*Micropterus dolomeiui*	Introduced (nonnative)
Yellow perch	*Perca flavescens*	Introduced (nonnative)
Common carp	*Cyprinus carpio*	Introduced (nonnative)
Brown bullhead	*Ictalurus nebulosus*	Introduced (nonnative)
Black crappie	*Pomoxis nigromaculatus*	Introduced (nonnative)
White crappie	*Pomoxis annularis*	Introduced (nonnative)
Bluegill	*Lepomis macrocheilus*	Introduced (nonnative)
Tench	*Tinca tinca*	Introduced (nonnative)
Warmouth	*Lepomus gulosis*	Introduced (nonnative)
Goldfish	*Carassius auratus*	Introduced (nonnative)
Pumpkinseed sunfish	*Lepomis gibbosus*	Introduced (nonnative)

Source: Pfeifer and Bradbury 1992, Kerwin 2001.

Coho salmon are relatively abundant and have a wider distribution in the subbasin than most of the other anadromous salmonids (King County 2013a). Adults typically return to Lake Washington from mid-August and to the end of January. While spawning occurs in most of the stream systems in proximity to the build alternatives, existing passage barriers block access to most stream reaches within or adjacent to the project sites. Juveniles rear in their natal tributaries for approximately 1.5 years before migrating downstream and through the lake to Puget Sound during the spring of their second year (Kerwin 2001). While relatively large numbers of coho salmon are reared at the WDFW Issaquah salmon hatchery, most coho salmon occurring in the subbasin are naturally produced.

Chinook salmon are also broadly distributed across the Lake Washington subbasin (King County 2013a), with core spawning populations present in the Cedar River, Bear Creek, Little Bear Creek, and North Creek. Area populations have been influenced by substantial hatchery production at the Issaquah Creek Fish hatchery (Leonetti et al. 2005).

Rainbow trout occur in relatively low numbers in the Lake Washington subbasin relative to the more abundant cutthroat trout, but are present in the lake year round and may occur in tributary watersheds affected by the construction alternatives. Steelhead, the anadromous form of rainbow trout, are known to have occurred historically in the Kelsey Creek and Swamp Creek drainages (King County 2013a; Scott et al. 1986). Adult steelhead spawners return from the ocean from December to April, and spawn in late winter and spring. Juvenile steelhead rear in tributaries streams for about 2 years, before migrating to saltwater in the spring (Kerwin 2001).

Coastal cutthroat trout (resident and anadromous forms) are moderately abundant and broadly distributed in the Lake Washington system (King County 2013a). Anadromous (sea-run) adult cutthroat trout return to the lake in late winter and early spring, and spawn in tributary streams during spring, as do resident cutthroat trout. Juveniles rear in the tributaries for 1 to 2 years, before migrating to the lake, where they continue to rear, although the sea-run juveniles migrate to saltwater in late spring to early summer (Kerwin 2001). Resident cutthroat trout have a wide distribution in the system, occurring in many small streams that may or may not support other salmonids, including the streams in the build alternative sites.

While bull trout occasionally occur in the lake, these are likely to be foraging, overwintering fish from other Puget Sound systems and reside there only temporarily (Berge and Mavros 2001). The only known self-sustaining population is resident bull trout in the Rex River and other tributaries in the upper Cedar River drainage, above Lower Cedar Falls (King County 2000b). Bull trout are unlikely to occur the build alternative site streams because the habitat conditions are not suitable for this species (King County 2000b).

3.2.2.2 Swamp Creek Subbasin

The Swamp Creek subbasin is a minor tributary to the Lake Washington hydrologic unit, with a number of tributaries, including Scriber, North, and Little Bear Creeks (Figure 3.2-1). Swamp Creek flows into the Sammamish River, a 13.8-mile long water body connecting Lake Sammamish and Lake Washington. Swamp Creek flows from the north, draining urbanized areas in and around with the Cities of Lynnwood, Brier, Mountlake Terrace, and Mukilteo. The Lynnwood Alternative site lies exclusively within the Scriber Creek drainage; therefore, the affected environment description is limited to Scriber Creek and relevant areas downstream of the confluence of Scriber Creek with Swamp Creek. Swamp Creek is on the Ecology 303(d) list of streams with polluted waters for

exceeding allowable levels of fecal coliform bacteria, pH (acidity), and dissolved oxygen (Washington State Department of Ecology 2012).

Coho, Chinook, and sockeye salmon, steelhead trout, and sea-run and resident cutthroat trout use Swamp Creek and its tributaries (King County 2013a). Currently, resident cutthroat trout are the predominant salmonid species that spawn in the Swamp Creek Basin, inhabiting almost all accessible habitat. Chinook salmon spawners were observed in Swamp Creek (between RM 0-8), as well as in Scriber Creek in the mid to late 1980s (Snohomish County 2002). Currently, Snohomish County's Chinook salmon distribution map (Snohomish County 2002) lists Chinook salmon having a known distribution in Swamp Creek upstream to I-5 and I-405. Coho salmon are found throughout much of the drainage, with distribution up to at least Airport Road. While sockeye salmon are abundant in the Lake Washington system, their distribution in Swamp Creek is limited to areas below Lake Stickney. Steelhead trout are also likely to occur in Swamp Creek and are likely to access habitats as far upstream as I-405 (Kerwin 2001). There are no reports of kokanee above the mouth of Swamp Creek.

Downstream of the Scriber confluence, Swamp Creek flows through a predominantly low-density suburban residential area. In these middle segments, large areas of forest are still common and the riparian corridor is reasonably intact for an otherwise urbanized sub-watershed. The lower segments of the creek located in King County flow through residential and commercial developments associated with the Kenmore/Bothell areas. The mainstem of Swamp Creek drains into the Sammamish River just upstream of its outlet into Lake Washington.

Scriber Creek

Scriber Creek is a primary tributary of Swamp Creek, with a drainage encompassing approximately 6.1 square miles of urbanized landscape covering portions of the cities of Lynnwood and Mountlake Terrace, including Alderwood Mall and a large section of the Highway 99 commercial corridor (King County 2001). This drainage area was estimated to have approximately 39% effective impervious area (EIA) (Snohomish County 2002). Jones and Stokes (2000) identified untreated runoff from impervious surface areas as likely sources of excessive fine sediment in portion of Scriber Creek, including the reach adjacent to the Lynnwood Alternative site (Figure 3.2-1). These are also sources of other pollutants, such as hydrocarbon pollutants from grease and oils.

Scriber Creek near the downstream end of the Lynnwood Alternative site, showing I-5 culvert

The headwaters of Scriber Creek are located in the northern portion of the City of Lynnwood near 164th Street SW and upstream of Highway 99 (City of Lynnwood 2009). Downstream of Highway 99, Scriber Creek flows south into Scriber Lake, a small urban lake with a surface area of about 3.4 acres. The creek flows southeast from the lake through a series of open channel and piped segments before reaching the proximity of the Lynwood Alternative site. The creek flows through a box culvert under the intersection of 200th Street SW and 50th Avenue SW and continues for approximately 0.15 miles through an open channel and pond before entering the large Scriber Creek wetland that borders and partially overlaps the Lynnwood Alternative site (Figure 3.2-1). The Scriber Creek wetland occurs between 50th Avenue SW (Cedar Valley Road) and I-5. Within the wetland, Scriber Creek flows through a well-defined channel over approximately 56% of its length, but then disperses out of a defined channel with water flowing through the wetland (City of Lynnwood 2009). Downstream of the Lynnwood Alternative site, Scriber Creek crosses under I-5 near 204th Street SW through an approximately 360-foot-long culvert (Washington State Department of Transportation and Washington Department of Fish and Wildlife 2013), before combining with Poplar and Golde Creeks, and eventually discharging to Swamp Creek near the intersection of Cypress Way and Locust Way (City of Lynnwood 2009).

The wetland complex adjacent to the Lynnwood Alternative site provides an extensive riparian corridor throughout much of the 100-year floodplain of the stream. Most of the stream's regulated buffer falls within the wetland. Scriber Creek enters the wetland as a defined channel, but the channel loses definition within the wetland, becoming more of an anastomosing channel plan form (i.e., stable, low energy channel with fine sediments). The Scriber Creek wetland, thus, provides water quality improvement functions for Scriber Creek by slowing flows and filtering fine sediments and some stormwater-related pollutants. The dense tree and shrub vegetation also provides other valuable riparian functions that benefit water quality conditions in downstream habitats.

Although the culvert under I-5 appeared to be fish passable at the time of the 2012 reconnaissance survey, it has been variously described as passage for anadromous species (Washington Department of Fish and Wildlife 2013) and as a partial (30% passable) barrier (Washington State Department of Transportation and Washington Department of Fish and Wildlife 2013). Although WDFW (2013) identified this culvert as passable for anadromous fish species, they also identified a beaver dam/wetland complex approximately 0.45 mile downstream of the culvert as a complete passage barrier that prevents upstream migrating salmonids from using the portion of Scriber Creek within the Lynnwood Alternative site.

The apparent lack of a defined stream channel through the Lynnwood Alternative site wetland complex may also present a barrier to fish, at least during low flow periods. However, the City of Lynnwood (2004) reported observations of adult coho in the stream, as far upstream as Highway 99, about 1 mile upstream of the Lynnwood Alternative site, indicating that these barriers are at least partially passable under certain conditions. Cutthroat trout have also been documented in Scriber Creek from the I-5 culvert upstream to at least as far as Scriber Lake (Sound Transit 2013). Habitat conditions in this area are also suitable for other resident and migratory fish species, including lamprey and sculpins (Table 3.2-4).

3.2.2.3 Kelsey Creek Subbasin

The BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites are located in the headwaters of smaller tributary to Kelsey Creek. These tributaries have been extensively modified by urban development, with the majority of stream length either channelized or piped. Anadromous

and migratory fish access to these headwater areas from downstream reaches of Kelsey Creek and Lake Washington is typically limited or completely blocked, although these streams would typically support a number of resident fish species that are tolerant of water and habitat conditions resulting from extensive urban development (Table 3.2-4).

Kelsey Creek is a relatively large tributary to Lake Washington, with a number of smaller tributaries, including the West Tributary, Goff Creek, Valley Creek, Sears Creek, Sunset Creek, Richards Creek, and several unnamed tributaries. Of these tributaries, the West Tributary occurs adjacent to the BNSF Alternative and BNSF Modified Alternative sites, and Goff Creek flows through a portion of the SR 520 Alternative site (Figure 3.2-2). The basin drains an area of about 2,822 acres, with about 40% impervious surface area, including about 17% impervious area within the 100-foot stream buffers (City of Bellevue 2010b). The Kelsey Creek mainstem extends for about 8.6 miles from the headwaters at Phantom Lake downstream to Mercer Slough, although the overall basin has about 19 miles of open stream channel (Kerwin 2001). Topographic relief is relatively flat throughout the creek, with about 330 feet of elevation change and an average slope of 0.7%.

Chinook and coho salmon are known to spawn upstream to about Larson Lake, while sockeye salmon typically occur in the lower 5 miles of the mainstem, and in some tributaries within this lower river reach (City of Bellevue 2007b). Salmon run sizes to the Kelsey Creek basin vary from year to year, although escapements in recent years have been low. Chinook salmon escapements between 2000 and 2011 were typically less than 20 fish, except for 2006 (180 fish) and 2007 (193 fish) (City of Bellevue 2012b). However, no Chinook salmon were observed in 2010, and only one carcass in 2011. Coho salmon escapements ranged from zero fish in 2002, 2004, 2005, 2010, and 2011, to a high of 40 fish in 2000, and an 11-year average of 11 fish (City of Bellevue 2012b). A similar escapement pattern was observed for sockeye salmon, ranging from zero fish in 2003, 2008, 2009, 2010, and 2011 to a high of 488 fish in 2006. The known habitat areas that support these species are all outside the project study area.

In addition to the anadromous salmon species, Kelsey Creek also supports sea-run cutthroat trout and potentially steelhead, although the distribution and status of these populations is generally unknown. Resident fish also likely include rainbow trout, cutthroat trout, sculpins, lampreys, and suckers (Table 3.2-4). Thousands of peamouth also typically migrate upstream from Lake Washington to spawn in Kelsey, Sturtevant, West Tributary of Kelsey Creek, and possibly other tributaries (City of Bellevue 2011b).

Factors limiting the production of salmonids in Kelsey Creek and all its tributaries are those common to most urban streams. The accumulation of fine sediments in spawning areas reduces egg survival and aquatic insect production. Land use development has degraded stream habitat by reducing channel complexity and pool densities. The increased impervious surface area, results in higher peak flows and lower summer base flows than pre-development conditions. The total impervious surface area in the Kelsey Creek basin is greater than 40%, with 17% impervious area within the stream buffer (City of Bellevue 2010b). Stormwater runoff from pollution-generating impervious surface areas (i.e., roads and parking lots) degrades water quality. Kelsey Creek is on the Ecology 303(d) list of streams with polluted waters for exceeding allowable levels of fecal coliform bacteria, temperature and dissolved oxygen (Washington State Department of Ecology 2012).

Sturtevant Creek

Sturtevant Creek is a small, 1.9 miles long stream, draining about 773 acres of a highly urbanized area of Bellevue, with an impervious surface area of more than 68% of the drainage area (City of

Bellevue 2010b). This high percentage of impervious area produces substantial fluctuations in flow (i.e., flashy hydrology). The stream originates upstream of Lake Bellevue in small drainage ditches adjacent to the BNSF rail line within or in proximity to the Lynnwood Alternative, BNSF Alternative, and BNSF Modified Alternative sites. Lake Bellevue is surrounded by multifamily residences, commercial buildings (including some built on piers over the lake), parking lots, and streets. From Lake Bellevue, the stream flows generally south, and outlets to Mercer Slough. A substantial portion of the drainage is contained in culverts and pipes, including a long culvert under I-405, next to the Hilton Hotel.

Chinook salmon, sockeye salmon, and cutthroat trout are known to use Sturtevant Creek up to the impassable I-405 culvert. As with Kelsey Creek, the lower reaches of this stream also supports Lake Washington peamouth spawning. While spawning and rearing habitat quality is generally poor throughout much of the stream, some areas have moderately good habitat conditions (Herrera Environmental Consultants 2005, 2006).

Within the BNSF Alternative and BNSF Modified Alternative sites, a hillside seep and linear depressional wetland (Wetland E1-1a as described below) lies along the west side of the former BNSF railroad tracks. The southern end of this wetland conveys water south into off site wetland areas that are part of the Sturtevant Creek basin.

Lake Bellevue

Lake Bellevue is a small lake that collects the headwaters of Sturtevant Creek, located just south of the BNSF Alternative and BNSF Modified Alternative sites (Figure 3.2-2). It is entirely surrounded by offices and businesses, most of which are built on pilings in the lake. The only fish species known to be present in the lake is goldfish (Sound Transit 2011).

West Tributary to Kelsey Creek

The West Tributary to Kelsey Creek originates near the I-405/SR 520 interchange, just north of the BNSF Alternative and BNSF Modified Alternative sites (Figure 3.2-2), and flows southeast and south to the confluence with Kelsey Creek, at river mile 2.6. Although there are numerous culverts throughout this reach, about 2.8 miles of open channel still exists (Kerwin 2001). The average channel slope is gradual at 0.8%. A substantial portion of the estimated 1,006-acre drainage area is developed, with about 46% impervious surface area, including 28% within the 100-foot stream buffer (City of Bellevue 2010b). This development consists of predominantly industrial, commercial, and residential uses.

The portion of stream that is adjacent to the BNSF Alternative and BNSF Modified Alternative sites flows through two relatively large, forested wetlands (Figure 3.2-2, Wetlands E2-3 and E2-4 as described herein), which function to naturally detain and treat stormwater. While this portion of the stream has substantial stream riparian vegetation (up to 70% bank cover) in some areas, some of the stream in this reach is contained within pipes. The riparian vegetation provides effective erosion protection and stormwater filtration functions, as well as shade and a source of organic nutrients to the stream. The overall aquatic and riparian habitat conditions of the West Tributary of Kelsey Creek are moderate-to-poor (Herrera Environmental Consultants 2005).

Chinook, coho, and sockeye salmon, and cutthroat trout have been reported in the lower reaches of the West Tributary, up to a partial fish barrier at Bel-Red Road (Washington Department of Fish and Wildlife 2013). Peamouth have also been observed spawning in this same reach (City of Bellevue

2011b). In addition, the one Chinook salmon carcass observed in the entire Kelsey Creek drainage in 2001 occurred in the lower reach of the West Tributary, over 1 mile downstream of Bel-Red Road (City of Bellevue 2012b). Juvenile fish surveys conducted in 2001 upstream of Bel-Red Road by the City of Bellevue resulted in no fish captured at the two sites sampled (City of Bellevue 2010b).

A Pacific giant salamander (*Dicamptodon tenebrus*) was captured at one site upstream of Bel-Red Road, downstream of the BNSF and BNSF Modified Alternative sites (City of Bellevue 2010b).

Goff Creek

The 680-acre Goff Creek drainage is small and narrow. Its headwaters are in Bridle Trails State Park, north of SR 520, and the streamflows south for about 1.4 miles, entering the West Tributary to Kelsey Creek just downstream of Bel-Red Road. The drainage has predominantly suburban/rural land uses upstream of SR 520 and commercial uses downstream, with greater than 30% impervious surface area. The drainage has an overall average channel gradient of 2%.

Overall, fish use upstream of Bel-Red Road is expected to be limited due to the generally poor stream and riparian habitat conditions and extensive culverts causing fragmented habitat. However, the open channels provide other important stream functions, including contributions to groundwater-fed base flows and water temperatures in downstream reaches, and transporting nutrient and organic material downstream to support the base of the aquatic food chain.

Anadromous sockeye, coho, and Chinook salmon and adfluvial and anadromous cutthroat trout may occasionally use portions of Goff Creek downstream of this barrier for spawning and rearing, although the frequency and distribution of occurrence and use is variable (City of Bellevue 2012b). In 2006, 12 live and 8 Chinook salmon carcasses were observed during stream surveys in Goff Creek (City of Bellevue 2007b), while in 2010 there was no evidence of Chinook salmon presence in Goff Creek, and the only recorded observation in the entire Kelsey Creek drainage in 2011 was a single pre-spawn carcass found in the West Tributary (City of Bellevue 2012b). Resident cutthroat trout are known to inhabit Goff Creek upstream of the passage barrier at Bel-Red Road (City of Bellevue 2009c); however, habitat fragmentation and channel conditions within the SR 520 Alternative footprint may limit habitat suitability for this species within the proposed project footprint.

The approximately 917 foot long portion of Goff Creek within the SR 520 Alternative site footprint (Figure 3.2-2) is currently inaccessible to anadromous and adfluvial salmonid species due to the presence of an impassable culvert at the Bel-Red Road crossing (Washington Department of Fish and Wildlife 2013). Resident fish species may occur in this portion of the stream however, particularly resident cutthroat trout, which are known to occur throughout the length of Goff Creek (City of Bellevue 2007a). Other common species include various sculpins (Table 3.2-4).

Goff Creek flows into the SR 520 Alternative site through a 200-foot-long culvert under SR 520. This SR 520 culvert is perched at the downstream end, with a 4-foot drop, making it impassable to upstream fish movement. The reach downstream from this culvert within the site varies in configuration between a piped channel (224 feet of the total length in the site), a surface channel confined by 3- to 4-foot-high rock walls, and an unconfined channel flowing through landscaped lawn along NE 20th Street. The stream and associated near surface groundwater along NE 20th creates Wetland E3-2 as described below. No natural riparian habitat is present along the creek; the open channel portion is fringed by predominately ornamental landscape vines and lawn grass. The bankfull channel width through the SR 520 Alternative site varies from about 3 to 8 feet.

Vegetation adjacent to the stream channel provides limited benefits to the stream (i.e., shade and nutrients) consisting primarily of planted ornamental shrubs and ground cover, and a short channel segment bordered by manicured lawn. The morphology of the exposed channel consists primarily of riffle and glide habitat, with relatively clean gravel substrate, interspersed with quarry spall and riprap grade controls. A parking lot culvert with a 3-foot outfall drop within the project site boundaries also poses a complete upstream passage barrier. While substrate conditions appear to be suitable for resident cutthroat trout spawning, habitat access is limited by upstream and downstream barriers, and rearing habitat appears to be limited within the reach. Only two pools were observed.

Groundwater emerges from a pipe under a parking lot in the north-central section of the project site and flows through an artificial channel to the east of Goff Creek, described as a water of the U.S. in Section 3.4. This feature was not considered a stream, per the City of Bellevue Municipal Code (20.25H.075A), because it is an artificial channel that is not accessible to salmonids because it is isolated from fish passable sections of Goff Creek by numerous impassable culverts and other stormwater infrastructure. There is no evidence that this feature was historically a natural stream channel, based on review of 1936 aerial photos and the topography of the area as depicted by the 1:24,000 USGS topographic quadrangle.

Goff Creek and these groundwater-originating channels appear to combine adjacent to Northrup Way, and pass through a vertical standpipe and culvert under the roadway, conveying flow to the downstream reaches of Goff Creek.

Typical Goff Creek habitat conditions in the SR 520 Alternative site, between SR 520 and Northup Way. Photo on the right also illustrates a portion of Wetland E3-2.

Unnamed Tributary to Kelsey Creek

The Unnamed Tributary to Kelsey Creek occurs east of, and parallel to, Goff Creek (Figure 3.2-2). This small stream (4-foot bankfull channel width), flows intermittently from a pipe on the south side

of NE 20th Street/Northup Way opposite the SR 520 Alternative site, and adjacent to 136th Place NE (Figure 3.2-2). The exposed channel flows south for about 200 feet, before entering another pipe. It remains piped for nearly 1,500 feet, between this point and its confluence with Kelsey Creek at Bel-Red Road, with the piped segment presenting a complete barrier to anadromous and adfluvial fish passage. The entire drainage flows a through commercial development area, with extensive impervious surface areas, and minimal open channel habitat. The 200-foot open channel segment is characterized by shallow glide habitat composed of fine gravel, sand and fine sediment interspersed with reed canarygrass. Overall, the stream and riparian habitat conditions are considered poor and marginally functional.

Valley Creek

Valley Creek is a tributary of Kelsey Creek, which flows from north to south, just east of the SR 520 Alternative site (Figure 3.2-2). The creek occurs east of 140th Avenue NE, and crosses the SR 520 corridor under a highway overpass. There are no fish barriers between Kelsey Creek and the project area, and anadromous fish access extends for about 1.5 miles upstream of the project area. Historically, cutthroat trout and sockeye, Chinook and coho salmon have been observed in this accessible reach (City of Bellevue 2010a). Recent assessments have found cutthroat trout, juvenile coho salmon, lamprey, sculpin, and nonnative bluegill in the project area reach (City of Bellevue 2007b, 2012b). Although the creek flows through a substantially developed corridor, of commercial and residential land use, much of the channel has a narrow vegetated riparian buffer that provides some shade, bank protection, and a nutrient source for the stream.

Within the SR 520 Alternative site, a linear slope and depressional wetland (Wetland E3-5 as described below) lies along the forested slope between SR 520 and the northeastern corner of the site. The eastern end of this wetland conveys water east and south as part of the Valley Creek basin.

3.2.2.4 Federal and State Threatened, Endangered, and Candidate Species, and Federal Species of Concern

The federal ESA is administered by NMFS and the USFWS. NMFS is responsible for animals that spend most of their lives in marine waters, including anadromous fish (e.g., Pacific salmon), while the USFWS is responsible for land animals and for fish species that typically only occur in freshwater habitats (e.g., bull trout). NMFS and USFWS are collectively referred to as the 'Services' in reference to ESA consultation conducted relative to potential impacts on ESA listed species.

Under the ESA, the unauthorized "take" of an ESA-listed species is prohibited, for projects that require federal actions (permitting or funding). Authorized take is typically obtained through consultations with USFWS and/or NMFS under Section 7 of the ESA. Through these consultations, NMFS or USFWS then issues a biological opinion, which identifies likely impacts (take) of the action, and specific avoidance and minimization measures to eliminate or minimize take to the maximum extent practicable.

The following federally listed, proposed, candidate, and federal species of concern are known or could occur in (or downstream) of build alternative sites (U.S. Fish and Wildlife Service 2013; NMFS 2013a). The corresponding state listing status is also provided for these species. Critical habitat has been designated for Chinook salmon and bull trout, and proposed for steelhead.

Puget Sound Chinook Salmon (Federal Threatened; State Candidate)

Adult Chinook salmon enter Lake Washington from early July through October to spawn in tributary areas. These adult fish remain in the lake for varying, but typically short periods of time, before migrating to upstream areas to spawn in the fall. In addition to this natural spawning, several hatchery programs at the Issaquah Creek hatchery support the population. In addition to this primary hatchery, a small research hatchery operated at the University of Washington until 2010, and although this facility is no longer in operation, adult Chinook will continue to return to Lake Washington for several more years. Lake Washington Chinook salmon are "ocean-type" fish, which rear in freshwater as juveniles for relatively short periods of time (typically 3 to 6 months) before entering Puget Sound. While some juveniles enter the lake as fry and rear in the lake until late spring/early summer, most juveniles rear in streams until late spring/early summer before migrating into and through the lake.

While Chinook salmon do not occur in the stream reaches that flow through any of the build alternative sites, they are known to occur or potentially occur in downstream reaches. This includes the lower reaches of Goff, Kelsey, West Tributary of Kelsey, Scriber, and Swamp creeks. None of these streams are designated critical habitat for Chinook salmon, although Lake Washington is designated as critical habitat.

Puget Sound Steelhead (Federal Threatened; State Candidate)

Adult steelhead typically return to Lake Washington from December through April, and spawn in late winter and spring in tributary rivers and streams. As with Chinook salmon, the steelhead population is supported by a hatchery program. While naturally spawned juveniles typically rear in tributary areas for two years before migrating to the lake and Puget Sound, hatchery steelhead typically only rear in the system for a few months after their release. Steelhead smolts migrate downstream to Lake Washington beginning in April, where they may remain for several months before migrating out by mid-June (Kerwin, 2001). Resident rainbow trout (the nonanadromous form of steelhead) are present in the lake or tributary streams all year long.

While steelhead do not occur in the stream reaches that flow through any of the build alternative sites, they are known to occur or potentially occur in some downstream areas, including lower Kelsey Creek (Mercer Slough), Scriber, and Swamp Creek. NMFS has recently proposed critical habitat for Puget Sound steelhead, although the Lake Washington watershed would be excluded from designation under the proposed rule (NMSF 2013b).

Puget Sound Bull Trout (Federal Threatened; State Candidate)

Bull trout rarely occur in Lake Washington, although several fish are observed each year entering Lake Washington through the fish ladder Hiram Chittenden Locks, in Ballard. While it is generally believed that these fish are seasonal transient strays (i.e., not native to the Lake Washington system) a population of bull trout is known to occur in the headwaters of the Cedar River, in the Chester Morse Reservoir. Although there are not fish passage facilities at the dam, fish could occasionally be transported downstream to the lake. However, there is no known spawning population downstream of Chester Morse Reservoir.

Consequently, bull trout do not occur in any of the streams that flow through any of the build alternative sites. There is also no designated bull trout critical habitat near any of the build alternative sites.

Puget Sound/Strait of Georgia Coho Salmon (Federal Species of Concern)

Adult coho salmon enter Lake Washington from about mid-August through January, and spawn in most accessible tributaries. Juveniles typically rear in these natal tributary areas for about 1.5 years, before migrating into and through the lake in the spring. However, some juveniles could enter the lake earlier, to rear for a variable length of time. As with the other salmonids in the system, coho salmon are also supported by hatchery fish, although the majority of the production is natural.

While coho salmon do not occur in the stream reaches that flow through any of the build alternative sites, they are known to occur in downstream reaches. This includes the lower reaches of Goff, Valley, Kelsey, West Tributary of Kelsey, Scriber, and Swamp creeks.

River Lamprey (State Candidate, Federal Species of Concern)

River lampreys are anadromous and parasitic. Adults migrate into deep freshwater habitats in the fall. They spawn in the winter and spring and die after spawning. Based on comparisons with other lamprey species, Hart (1973) surmised that river lamprey ammocoetes (larvae) remain in their natal streams for several years, before migrating to saltwater in late spring. While in freshwater, lamprey ammocoetes (larvae) typically burrow into silt/sand substrate in slow-moving stream reaches.

Little is known about their distribution in the Lake Washington watershed, but based on described habitat preferences, river lamprey could occur within or downstream of each of the build alternative sites. Some data on lamprey occurrence are available, but this information does not reliably differentiate between the lamprey species that occur in Lake Washington. For example, lamprey were found almost as far upstream as 148th Avenue NE in Kelsey Creek during fish surveys in 2007 (City of Bellevue 2010b) but they were not identified by species. Western brook lamprey were the only lamprey species identified in seven fish surveys conducted between 1983 and 2011 in the Kelsey Creek drainage (City of Bellevue 2011c). Western brook lamprey have also been observed in Valley Creek (City of Bellevue 2011c).

3.3 Vegetation and Wildlife Resources

The urban nature of the project vicinity limits the overall diversity of both vegetation and wildlife species in the study area, favoring wildlife that can adapt readily to human activity and urban habitats and plant species that are favored by humans for landscaping and/or occur naturally within urban protected areas, such as parks, riparian zones and wetlands. Despite the limited diversity, there are a certain number of wildlife species that use the patches of wetland and upland habitat within and around the build alternative sites as breeding, foraging, or resting habitat and a certain number of native plants that are perpetuated in these areas.

3.3.1 Vegetation Cover Types

Sound Transit identified six vegetation or cover types, including three forested categories based on dominate tree type (“Coniferous”, “Deciduous”, or “Mixed”) and one category for developed portions of each site containing little to no vegetation (“Developed”). Sound Transit did not use the vegetation classification system used in the environmental review of the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013), which consolidated all forest areas but subdivided developed areas more

finely into maintained vegetation, residential areas, and urban areas. Wetland vegetation is not differentiated in these six categories, but rather wetlands are mapped and described separately in Section 3.4 Wetland Resources. Project limits were defined as the construction footprint, including the areas of elevated tracks that would be constructed as part of each alternative to join the proposed project to other Sound Transit projects (i.e., Lynnwood Link Extension and East Link projects).

Table 3.3-1 provides descriptions and acreage of each vegetation type within the project limits for each alternative. Figures 3.3-1 to 3.3-4 illustrate the location and approximate extent of the mapped vegetation types within the project limits of each alternative. Section 3.3.4 discusses vegetation in the context of habitat available to wildlife for each alternative.

Table 3.3-1. Vegetation Identified within the Project Limits of Each Alternative

	Acres within each site(rounded to nearest acre)								
Vegetation Type[a]	**Lynnwood Alternative (C1)**	**Lynnwood Alternative (C2)**	**Lynnwood Alternative (C3)**	**BNSF Storage Tracks[b]**	**BNSF Alt**	**BNSF Modified**	**SR 520 Alt**	**General Description of Vegetation Categories[a]**	**Relative Wildlife Habitat Value**
Urban mostly vegetated – coniferous forest (UMVC)	**3**	**3**	**3**	**0**	**0**	**0**	**0**	Forest patches dominated by Douglas-fir and western red cedar with occasional black cottonwood, big-leaf maple, and red alder in the overstory. Dense canopy coverage. Trees mostly taller than 50 feet. Shrub layer often dominated by Himalayan blackberry but also may include salmonberry, snowberry, salal, Indian plum, and rhododendron.	High
Urban mostly vegetated – deciduous forest (UMVD)	**6**	**11**	**6**	**<1**	**1**	**5**	**<1**	Forest patches dominated by black cottonwood, willow, and red alder trees (40 to 70 feet tall). Understory shrubs include salmonberry and small willows. Himalayan blackberry pervasive in understory and on edges. Wetland areas include Douglas spirea.	High
Urban mostly vegetated – mixed forest (coniferous/ deciduous) (UMVM)	**1**	**<1**	**<1**	**1**	**1**	**1**	**<1**	Mixed Douglas fir, western red cedar, black cottonwood, and red alder in overstory. Understory includes scattered birch, willow, maple, and madrone. Shrubs similar to those of	High

Vegetation Type[a]	Acres within each site(rounded to nearest acre)							General Description of Vegetation Categories[a]	Relative Wildlife Habitat Value
	Lynnwood Alternative (C1)	Lynnwood Alternative (C2)	Lynnwood Alternative (C3)	BNSF Storage Tracks[b]	BNSF Alt	BNSF Modified	SR 520 Alt		
								coniferous forest type but also include Oregon grape and Scot's broom.	
Urban moderately vegetated (UMV)	**9**	**9**	**9**	**<1**	**< 1**	**<1**	**0**	Large (40 to 70 feet) coniferous or deciduous trees interspersed with open, grassy areas. Some patches of shrubs, including ornamental and nonnatives. Tree and shrub canopy cover values average less than 40%.	Moderate
Urban sparsely vegetated (USV)	**3**	**3**	**3**	**2**	**3**	**3**	**2**	Large native and ornamental trees, often in lines bordering commercial and industrial properties, road rights-of-way, and parking lots. Often lacking understory or with ornamental shrubs and herbs in understory.	Low
Developed (D)	**17**	**16**	**19**	**12**	**2 2**	**30**	**24**	Paved areas of commercial and industrial activities and associated parking lots, including abandoned areas of asphalt and concrete.	Low
Total Acres[c]	**38**	**42**	**40**	**15**	**2 7**	**39**	**26**		

[a] Vegetation types were adapted from designations developed for the East Link study area by Sound Transit (2011) from the King County (1987) Wildlife Habitat Profile.

[b] The project limits for the BNSF Storage Tracks component of the Lynnwood Alternative were defined as the parcel to be acquired, plus the area of the railroad tracks defined as part of the alternative.

[c] Acres within project limits include all parcels plus any construction footprint that may fall outside of these parcels in the ROW which could impact vegetation in these areas. Acres within project limits may thus be larger than affected parcel acres described in Chapter 2 of the EIS.

3.3.3 Federal and State Threatened, Endangered, and Candidate Species and Federal Species of Concern

Based on a review of the habitat present in the study area and data from WDFW PHS database, no state or federal Endangered Species Act (ESA) threatened or endangered plant or wildlife species is known or expected to occur in the study area for any of the alternatives. The U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service 2013) lists four threatened and one endangered wildlife species as occurring in King and Snohomish Counties. They are: grizzly bear (*Ursus arctos)*, Canada lynx (*Lynx canadensis*), marbled murrelet (*Brachyramphus marmoratus*), spotted owl (*Strix occidentalis*), and the endangered gray wolf (*Canis lupus*). The state of Washington lists these same species as either threatened or endangered (gray wolf, grizzly bear and spotted owl are endangered; murrelet and lynx are threatened). The study area does not provide habitat for any of these species and they will thus not be considered further in this analysis.

There are two federal species of concern, the bald eagle (*Haliaeetus leucocephalus*) and the peregrine falcon (*Falco peregrinus*), that are known to nest in the general vicinity of the project (within 2 miles of the BNSF Alternative and BNSF Modified Alternative sites). Three other federal species of concern, western toad (*Bufo boreas*), olive-sided flycatcher (*Contopus borealis*), and willow flycatcher (*Empidonax trailii*) could occur in the study area. These species are addressed in the following section (3.3.3, Priority Habitats and Species).

The disturbed nature of the upland and wetland vegetation communities at each of the build alternatives renders them unlikely to support any of the state or federally listed threatened or endangered plants which are known to occur in King or Snohomish counties (Table 3.3.2). There are no threatened or endangered plants documented in the study area for any of the alternatives (Washington State Department of Natural Resources 2012). There are also no plants listed by the state of Washington as priority or monitor within 2 miles of any of the alternative sites (Washington State Department of Natural Resources 2012). The NHI program database includes only one record of a state 'review' status plant species, the Vancouver ground-cone (*Boschniakia hookeri*), within 2 miles of any of the alternative sites (Washington State Department of Natural Resources 2012).

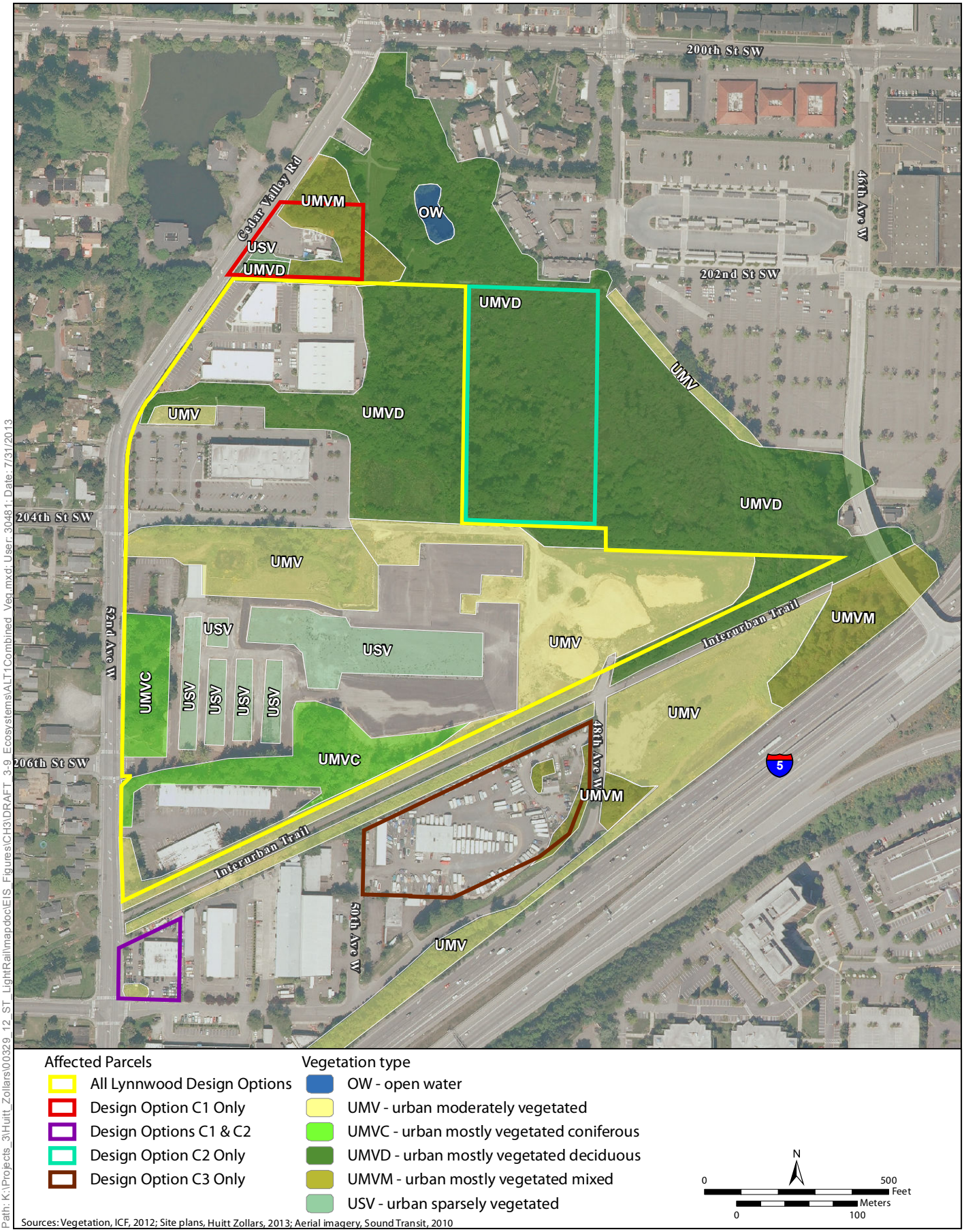

Figure 3.3-1a: Lynnwood Alternative—Vegetation
Ecosystems Technical Report

Figure 3.3-1b: Lynnwood Alternative, BNSF Storage Tracks*—Vegetation Ecosystems Technical Report

*The BNSF Storage Tracks are located in Bellevue

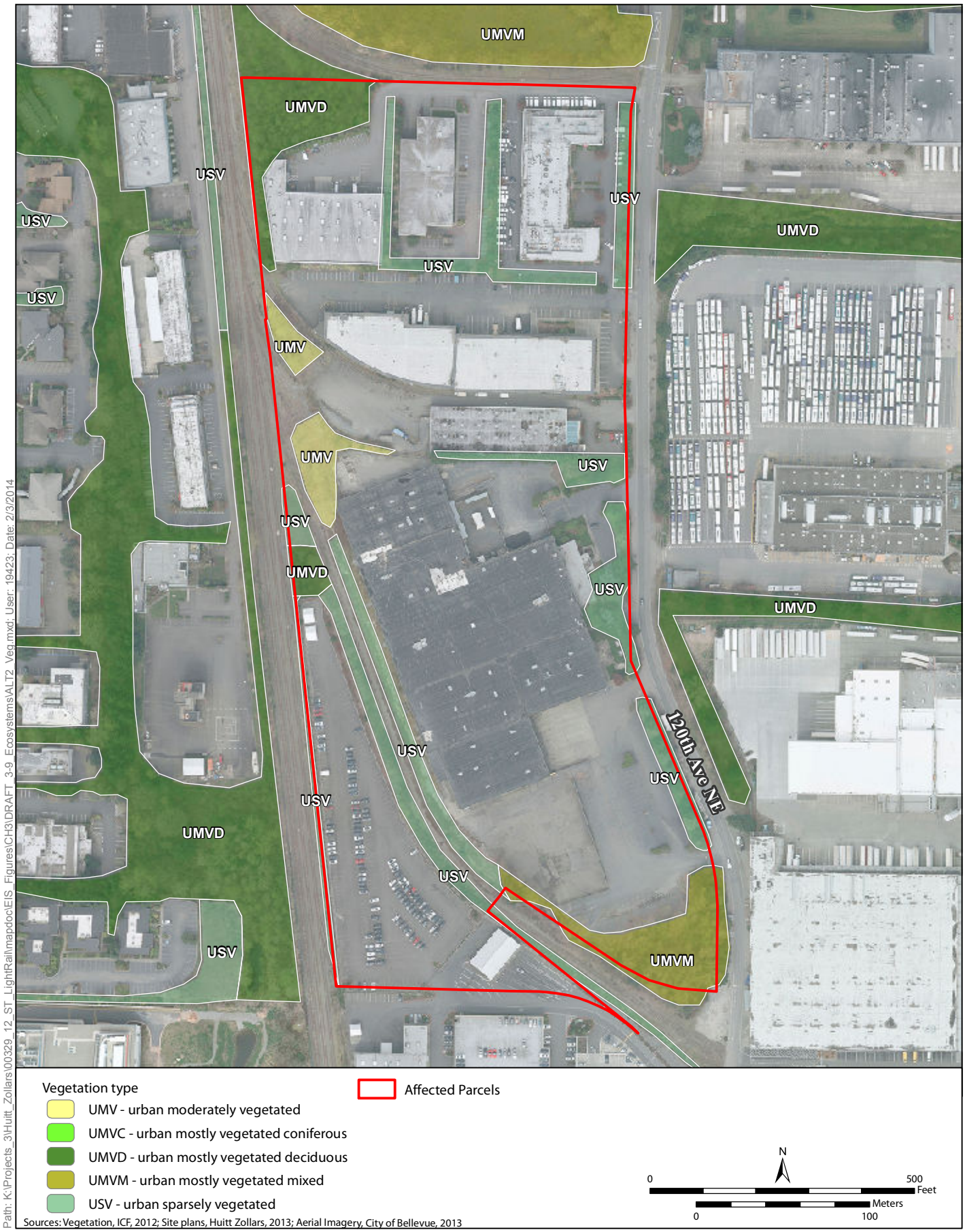

Figure 3.3-2: BNSF Alternative—Vegetation Ecosystems Technical Report

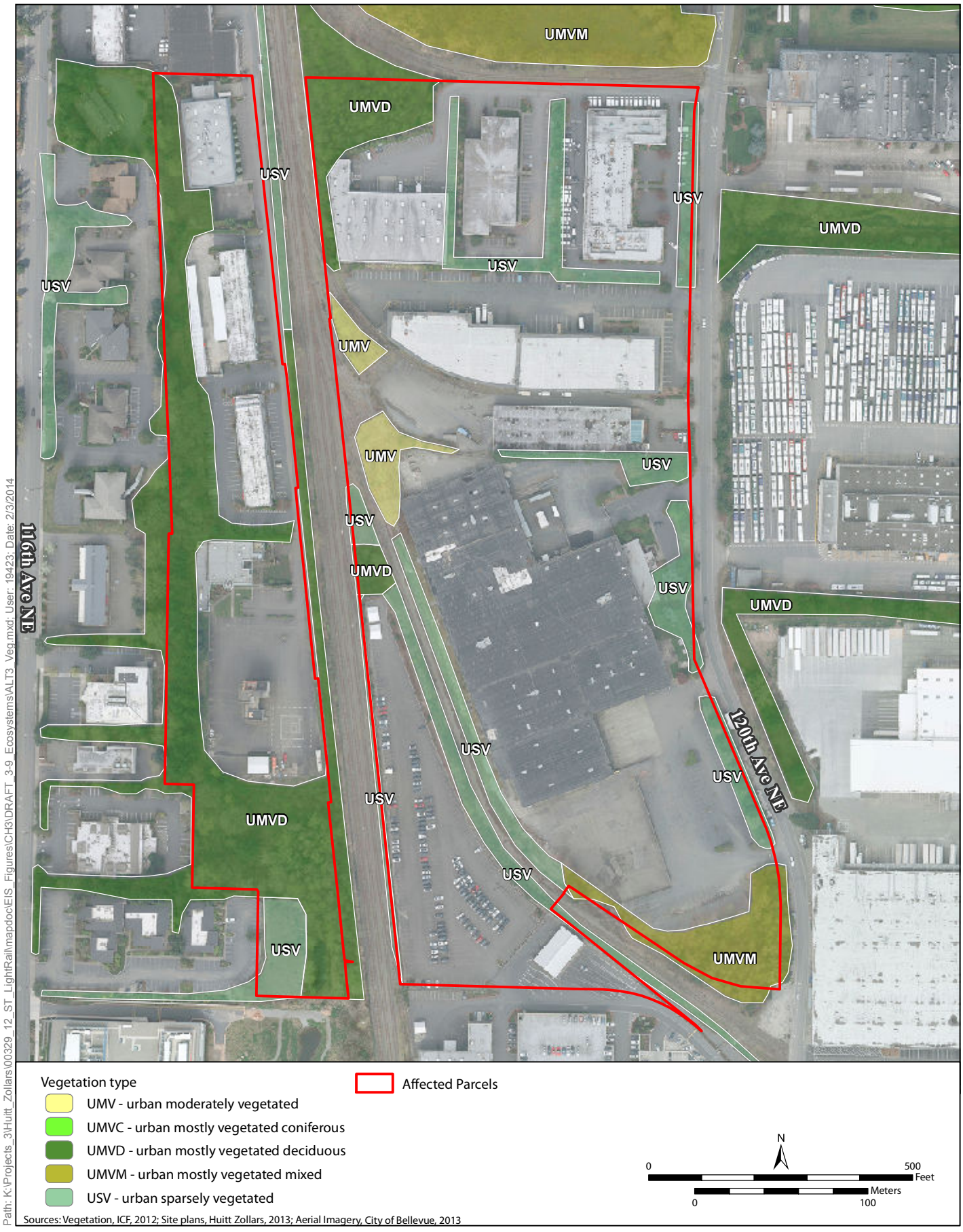

Figure 3.3-3: BNSF Modified Alternative—Vegetation
Ecosystems Technical Report

Figure 3.3-4: SR 520 Alternative—Vegetation
Ecosystems Technical Report

The Vancouver ground-cone was recorded in 2008 in Bridle Trails Park approximately 1.2 miles north (and across SR 520) from the SR 520 Alternative site. The Vancouver ground-cone is a root parasite (lacking its own chlorophyll) that grows in dense stands of salal (*Gaultheria shallon*) and young forest stands near salt water from 120 to 500 ft. elevation. It is found associated with western hemlock (*Tsuga menziesii)*, western red cedar (*Thuja plicata*), Sitka spruce (*Picea sitchensis*), and Douglas-fir (*Pseudotsuga menziesii*) (WNHP and BLM 2005). There is no suitable habitat for this species at any of the alternative sites because they are generally dominated by deciduous trees such as red alder and black cottonwood, with widely scattered patches of Douglas fir with nonnative understory species such as Himalayan blackberry, rather than the native salal that is the habitat for the Vancouver ground-cone.

3.3.4 State Priority Habitats and Species

WDFW maintains a list of priority species and habitats in Washington State. Priority species include State Endangered, Threatened, Sensitive, and Candidate species; animal aggregations (e.g., heron colonies, bat colonies) considered vulnerable; and species of recreational, commercial, or tribal importance that are vulnerable (Washington Department of Fish and Wildlife 2012). Most federal threatened, endangered, candidate and species of concern are included in this list. Based on a query of the WDFW PHS database in November 2012, there are no priority species documented within the limits of any of the build alternatives. A list of priority species that could occur within the study area is found in Table 3.3-3, followed by a discussion of those species with known occurrences in the general vicinity of the build alternatives.

Table 3.3-2. Special Status Plant Species Documented in King County or Snohomish County

Common Name	Scientific Name	County	State Status	Federal Status	Historic Record	Habitat/Distribution
Tall agoseris	*Agoseris elata*	Snohomish	S			Meadows and open fields; mountains and foothills, 2,900 to 7,900 ft. elevation.
Swamp sandwort	*Arenaria paludicola*	King	X	LE	H	Prefers swamps, mostly along the coast. No known extant populations in Washington state.
Vancouver Island beggar-ticks	*Bidens amplissima*	King, Snohomish	R1		H	No known extant populations in WA state.
Vancouver ground-cone	*Boschniakia hookeri*	King, Snohomish	R1			Found in dense stands of salal. Associated species include western hemlock, western red cedar, Sitka spruce, and Douglas-fir.
Triangular-lobed moonwort	*Botrychium ascendens*	King	S	SC		2,100 to 5,400 ft. in elevation. No occurrences in Snohomish Co.
Stalked moonwort	*Botrychium pedunculosum*	King, Snohomish	S	SC		Meadows and coniferous forest, 1,800 to 6,300 ft. elevation.
Alaska Harebell	*Campanula lasiocarpa*	King, Snohomish	S			Rock crevices in alpine zones; 2,000 to 6,800 ft. elevation.
Bristly sedge	*Carex comosa*	King, Snohomish	S			Marshes, lake shores, and wet meadows; 50 to 2,000 ft. elevation.
Large-awn sedge	*Carex macrochaeta*	King	T		H	Moist or wet open places; near seepage areas, slide alder thickets, basalt cliffs at base of waterfall.
Poor sedge	*Carex magellanica ssp. irrigua*	Snohomish	S			Fens and bogs at mid- to high elevations.
Few-flowered sedge	*Carex pauciflora*	King, Snohomish	S			Sphagnum bogs and acidic peat soils.
Several-flowered sedge	*Carex pluriflora*	Snohomish	S			Wetlands and boggy lake margins, often in sphagnum and peaty soils.
Smoky Mountain sedge	*Carex proposita*	Snohomish	T			Ridge-tops and dry meadows at high elevations.
Long-styled sedge	*Carex stylosa*	King, Snohomish	S			Coastal regions of Washington and shallow marshes growing with knotweed, Indian paintbrush, and lupines.

Common Name	Scientific Name	County	State Status	Federal Status	Historic Record	Habitat/Distribution
Clubmoss cassiope	*Cassiope lycopodioides*	King	T			Likely to be found at higher elevations, the King Co. occurrence is found at around 6,562 ft.
Golden paintbrush	*Castilleja levisecta*	King	E	LT	H	Open grassland, glacial outwash or depositional material substrate.
smooth hornwort	*Ceratophyllum echinatum*	King	R1			Cool, clear, oligotrophic water of lakes, ponds, swamps.
golden chinquapin	*Chrysolepsis chrysophylla var. chrysophylla*	King	S			Dry, open sites to fairly thick woodlands. Associated with Douglas-fir/western hemlock forest. No known sightings in King Co.
tall bugbane	*Cimicifuga elata var. elata*	King	S	SC		Margins of mixed mature or old-growth stands.
Spleenwort-leaved goldthread	*Coptis aspleniifolia*	King, Snohomish	S			Old-growth forest, 360 to 2,200 ft. elevation.
Yellow-mountain avens	*Dryas drummondii var. drummondii*	Snohomish	S			Crevices of steep, rocky, dry cliffs; 1,900 to 6,800 ft. in elevation.
Toothed wood fern	*Dryopteris carthusiana*	King	R1			Sphagnum swamps and thickets with a peat substrate; 0 to 75 ft. elev.
Nuttall's waterweed	*Elodea nuttallii*	King, Snohomish	R1			Waters of lakes and rivers.
Salish fleabane	*Erigeron salishii*	Snohomish	S		H	Dry scree slopes and sedge meadows in the alpine zone.
Black lily	*Fritillaria camschatsensis*	King, Snohomish	S			Near lakes and streams and in wet meadows, salt marshes, and sphagnum bogs.
Oregon goldenaster	*Heterotheca oregona*	King	T			Sand and gravel bars along rivers.

Common Name	Scientific Name	County	State Status	Federal Status	Historic Record	Habitat/Distribution
Canadian St. John's wort	*Hypericum majus*	King	S			Along ponds, lakesides or other low, wet places. Many of the Washington occurrences are associated with riparian habitats. Associated species include *Equisetum* sp., *Juncus bufonius*, *J. tenuis*, *J. articulatus*, *Cyperus bipartitus*, *Luzula parviflora*, *Carex vulpinoidea*, *Deschampsia cespitosa*, *Phalaris arundinacea*, *Helenium autumnale*, *Myosotis laxa*, and *Plantago major*. Elevation in Washington ranges from 100 to 2,300 ft.
Water lobelia	*Lobelia dortmanna*	King, Snohomish	T			In shallow water at the margins of lakes and ponds.
Bog clubmoss	*Lycopodiella inundata*	King	S		H	Sphagnum bogs, wet, sandy places, wetlands adjunct to lakes, and swampy ground.
Treelike clubmoss	*Lycopodium dendroidium*	King, Snohomish	S			Rock outcrops, talus or boulder fields; 800 to 3,600 ft. elevation.
White meconella	*Meconella oregona*	King	T	SC	H	Occurs primarily in open grassland, sometimes within a mosaic of forest/grassland with Douglas-fir, ponderosa pine, and Garry oak.
Branching montia	*Montia diffusa*	King, Snohomish	S		H	Moist forests in the lowland and lower montane zones.
Texas toadflax	*Nutallanthus texanus*	King	S		H	Glacial outwash prairies from 140 to 200 ft. elev.
Harford's ragwort	*Packera bolanderi var. harfordii*	Snohomish	S		H	Only known in Snohomish Co. from historic record.
Pine-foot	*Pityopus californica*	Snohomish	T			Only one known site in Washington; Thurston County mixed forest with mossy ground cover.
Choris' bog-orchid	*Platanthera chorisiana*	King, Snohomish	T			In the wettest regions of sphagnum bogs and along streamsides. Elev. 2,500 to 4,300 ft.

Common Name	Scientific Name	County	State Status	Federal Status	Historic Record	Habitat/Distribution
Small northern bog-orchid	*Platanthera obtusata*	Snohomish	S			Damp or wet places in forests, marshes, bogs, meadows, and along streambanks. Most known occurrences in WA are in moist to wet forests dominated by *Picea engelmannii* and/or *Thuja plicata*.
Cooley's buttercup	*Ranunculus cooleyae*	Snohomish	S			Montane gravelly alluvial slopes, 1,600 to 6,400 ft.
Pygmy saxifrage	*Saxifraga hyperborea*	Snohomish	S			Alpine slopes, 6,000 to 7,000 ft. in elevation.
White-top aster	*Sericocarpus rigidus*	King	S	SC		Open grassland habitats.
Swertia	*Swertia perennis*	Snohomish	R1			Moist meadows in mountainous, subalpine areas.
Humped bladderwort	*Utricularia gibba*	King	R1		H	Lakes and lake edges. Believed extirpated from King County.
Flat-leaved bladderwort	*Utricularia intermedia*	King, Snohomish	S			Shallow ponds, slow-moving streams, and wet sedge or rush meadows.
Lesser bladderwort	*Utricularia minor*	King	R1			Low-nutrient lakes and peatbog pools.

State Status, Federal Status, and Historic Record Codes:

*State Status of plant species is determined by the Washington Natural Heritage Program. Factors considered include abundance, occurrence patterns, vulnerability, threats, existing protection, and taxonomic distinctness***.**
E = Endangered. In danger of becoming extinct or extirpated from Washington.
T = Threatened. Likely to become Endangered in Washington.
S = Sensitive. Vulnerable or declining and could become Endangered or Threatened in the state.
X = Possibly extinct or Extirpated from Washington.
R1 = Review group 1. Of potential concern but needs more field work to assign another rank.
R2 = Review group 2. Of potential concern but with unresolved taxonomic questions.

Federal Status under the U.S. Endangered Species Act (USESA) as published in the Federal Register:
LE = Listed Endangered. In danger of extinction.
LT = Listed Threatened. Likely to become endangered.
PE = Proposed Endangered.
PT = Proposed Threatened.
C = Candidate species. Sufficient information exists to support listing as Endangered or Threatened.
SC = Species of Concern. An unofficial status, the species appears to be in jeopardy, but insufficient information to support listing.

Historic Record: H indicates most recent sighting in the county is before 1977.

Table 3.3-3 lists state priority species that may possibly exist in the study area, along with a rating of "likely present," or "possibly present." These ratings are based on known habitat and/or species occurrence within and around the build alternative sites. There are no site-specific distribution data available for most of these species and no species-specific surveys or habitat assessments were conducted as part of the draft EIS. The likelihood of occurrence ratings is based on the combination of known habitat needs and preferences of the species and on the composition, amount, and distribution of appropriate habitat within the study area for each of the alternatives.

Table 3.3-3. State Priority Species That Could Occur in Study Area for the Build Alternatives

Common Name	Scientific Name	Description	Federal Status[a]	State Status[b]	Expected Occurrence in Study Area		Preferred Habitat/Basis for Occurrence Determination
					Likely Present	Possibly Present	
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Bat	FCo	SC		x	Uses riparian and forested habitats. Typically uses caves or mine tunnels for hibernation and maternity roosting.
Yuma Myotis	*Myotis yumanensis*	Bat	FCo	None		x	Closely associated with water, moist woodlands, and forests. Mapped in Puget Sound area.
Western Toad	*Bufo boreas*	Amphibian	FCo	SC		x	Breeds in ponds, lakes, and reservoirs and pools of slow-moving streams. Uses a variety of upland habitats, including moist forested areas. Large population declines in the Northwest. No documented sightings in the study area (Washington State Department of Natural Resources et al. 2011).
Bald Eagle	*Haliaeetus leucocephalus*	Bird	FCo	SM	x		Uses open water and forested habitats. Requires large trees near open water for nesting.
Peregrine Falcon	*Falco peregrinus*	Bird	FCo	SM		x	Sometimes nests on buildings or bridges in urban areas.
Pileated Woodpecker	*Dryocopus pileatus*	Bird	None	SC	x		Requires snags and extensive forested areas for breeding and feeding.

Common Name	Scientific Name	Description	Federal Status[a]	State Status[b]	Expected Occurrence in Study Area		Preferred Habitat/Basis for Occurrence Determination
					Likely Present	Possibly Present	
Purple Martin	*Progne subis*	Bird	None	SC	x		Nests in structures over water bodies. Nesting structure may be natural cavity, piling, or man-made housing structures. Known occurrences in King County as recently as 2003 (Sound Transit 2011).
Common Loon	*Gavia immer*	Bird	None	SS		x	Requires lakes or ponds with relatively undisturbed shoreline for nesting.
Western Grebe	*Aechmophorus occidentalis*	Bird	None	SC		x	Found on marshes, lakes, and bays, and nearshore marine environments.
Merlin	*Falco columbarius*	Bird	None	SC		x	Documented in King and Snohomish Counties.
Vaux's Swift	*Chaetura vauxi*	Bird	None	SC		x	Forages over wooded areas and open habitats. Uses large, hollow trees and sometimes chimneys for roosting/nesting.
Olive-sided flycatcher	*Contopus borealis*	Bird	FCo	SM		x	Breeds in coniferous forests of North America. Population in decline due to loss of winter habitat in Central and South America.
Willow flycatcher	*Empidonax trailii*	Bird	FCo	SM		x	Breeds in deciduous thickets, especially willow thickets. Nest site often close to water. Documented occurrences in King County.

[a] **Federal Status**: FCo=Federal Species of Concern

[b] **State Status**: SC=State Candidate, SCo=State Species of Concern, SS=State Sensitive, SM=State Monitor Species (this is the lowest level of species classification afforded to fish and wildlife species in the state of Washington. State Monitor Species are not considered Species of Concern, but are monitored for status and distribution in a particular area.

3.3.4.2 State Priority Species within Vicinity of Build Alternatives

Two priority wildlife species (the peregrine falcon and the bald eagle) are documented as breeding within 2 miles of the Alternatives 2 and 3 project sites in Bellevue. Snags in the Scriber Creek Wetland (Wetland N1-1, Lynnwood Alternative) showed signs (i.e., excavation cavities) of having been used as foraging habitat by a third priority species, the pileated woodpecker.

Peregrine Falcon

The peregrine falcon is a federal species of concern and state monitor species. The WDFW PHS database shows a pair of peregrine falcons known to have nested as recently as 2009 on a high rise building in downtown Bellevue (Washington Department of Fish and Wildlife 2012). This eyrie was located approximately 0.8 mile from the BNSF Alternative and BNSF Modified Alternative sites and approximately 1.6 miles from the SR 520 Alternative site. The database contains no information on the eyrie since 2009, but WDFW biologists say peregrines have used the site on and off over the years and it is not unlikely it could be used again (Anderson 2013). In western Washington, peregrines forage for pigeons, waterfowl, and other birds over large territories (Hayes and Buchanan 2001). It is reasonable to assume that any peregrines nesting in downtown Bellevue could include Alternatives 2, 3, and 4 in their foraging territory.

Bald Eagle

Although the bald eagle was delisted from federal threatened status in 2007, it remains a federal species of concern and state monitor species. Under the federal Bald and Golden Eagle Protection Act (1940), known nest sites must be protected within a 0.50-mile buffer around the nest. Known roosting sites must be protected within a 0.25-mile buffer. Bald eagles are known to nest close to the shorelines of Lake Washington and Lake Sammamish. The nearest nest sites documented in the WDFW PHS database are all greater than 1 mile from any of the build alternatives. Bald eagles nest close to open water and often feed on salmon from rivers, streams, lakes and coastal waters. Scriber Creek, which flows just outside the boundary of the Lynnwood Alternative site, is a salmon-bearing stream with riparian vegetation and could provide foraging and roosting habitat for bald eagles, although no occurrences are listed by WDFW (2012). There are no communal bald eagle roosts, winter concentration areas, or buffers for such areas documented within a half-mile of any of the build alternatives. Two bald eagles were observed soaring over the north end of the SR 520 Alternative site during the December 2012 site reconnaissance. Bald eagles often soar for long periods, particularly in the afternoons after feeding (Stinson et al. 2001: 8).

Pileated Woodpecker

Pileated woodpeckers require large tracts of forest with a strong component of dead and dying trees for foraging and nesting. In the Pacific Northwest they prefer coniferous forests with a tall, closed canopy and high basal area (NatureServe 2013). In western Washington the average breeding/foraging home range size is 1,480 acres (Larsen et al. 2004). They excavate their nests in decaying trees, often choosing Douglas-fir with an average diameter at breast height (dbh) of 69cm (27inches) (NatureServe 2013). Signs of pileated woodpecker foraging in snags were observed in the forested wetland (N1-1) along Scriber Creek adjacent to the Lynnwood Alternative site. Based on their size and degree of decay, the snags present in Wetland E2-4 adjacent to the northern edge of the Alternatives 2 and 3 sites may also provide foraging habitat for pileated woodpeckers. As part of fish and wildlife studies completed for Bellevue's NE 4th

Street/120th Avenue NE Corridor project, pileated woodpecker foraging was documented on a snag in a forested wetland located approximately 0.25 mile southeast of the build alternative sites along the BNSF tracks in Bellevue. i.e., the BNSF Storage Tracks component of the Lynnwood Alternative, the BNSF Alternative, and the BNSF Modified Alternative (Parsons Brinckerhoff 2011). Based on the presence of similar snags, pileated woodpeckers also likely to forage in Wetlands E2-3 and E2-4 (Parsons Brinckerhoff 2011).

3.3.4.3 Local Priority Species within Vicinity of Build Alternatives

The City of Bellevue considers habitat for species of local importance in all project proposals. Table 3.3-4 presents Bellevue species of local importance which not already included in the list of state priority species presented in Table 3.3.-3 and which have some potential for occurrence in the study area (based on existing habitat).

Table 3.3-4. City of Bellevue Species of Local Importance with Potential Occurrence in Study Area

Common Name	Scientific Name	Description	Preferred Habitat/Basis for Occurrence Determination
Red-tailed hawk	*Buteo jamaicensis*	Bird	Widespread. Perch in large trees. Forage over open areas. Prey on rodents.
Osprey	*Pandion halieatus*	Bird	Nest at top of tall tree or pole near open water. Prey on fish.
Green heron	*Butorides verisens*	Bird	Wading bird; forages in wetlands, ponds, and streams.
Great blue heron	*Ardea herodias*	Bird	Forage in wetlands, marshes, and fields.
Long-legged myotis	*Myotis volans*	Bat	Occurs in forested areas statewide. Prefers mountainous, coniferous forests. Often found along forest edges.
Long-eared myotis	*Myotis evoti*	Bat	Found in wooded areas statewide but most common in eastern Washington in lodgepole pine forests. Does occur in humid coastal forests with good ground cover. Will occur in any forested habitat except those with no ground cover or in mid-to-high density developments.

Bellevue does not maintain sighting or occurrence records for these species (Paine 2013), so use of the study area is unknown. Many are associated with wetlands, particularly those containing open water. The only wetland identified in the Bellevue portion of the study area that may contain open water is Wetland E2-4, located adjacent to the northern boundary of the BNSF Storage Yard portion of the Lynnwood Alternative site, as well as the BNSF Alternative and BNSF Modified Alternative sites. Great blue herons and green herons would be expected to occur in Wetlands E2-3 and E2-4 (adjacent to the BNSF Storage Tracks portion of the Lynnwood Alternative and the BNSF Alternative and BNSF Modified Alternative sites). Great blue herons and green herons would also be expected to occur in the habitats associated with Scriber Creek in Lynnwood, including in the portion of Wetland N1-1 within the Lynnwood Alternative site.

These wetlands would also be expected to provide hunting perches for red-tailed hawks, as would the trees and snags overlooking the railroad tracks and SR 520 associated with the

forested portion of Wetland E1-1 (BNSF Alternative site) and the trees in Wetlands E3-1, E3-4 and E3-5.

The WDFW PHS database documents an osprey nest about 0.3 mile west of the BNSF Alternative and BNSF Modified Alternative at Hidden Valley Sports Park. This nest is on the opposite side of I-405 from the proposed project sites. Osprey typically nest on structures over or adjacent to open water bodies and forage for fish in such areas (Ehrlich et al. 1988). None of the build alternative sites contains this type of habitat.

The Lynnwood municipal code does not list individual wildlife species as of local importance (LMC 17.10.030 and 17.10.080), but rather lists priority habitats (e.g., wetlands, streams, and essential upland habitat) as previously described in Section 3.1.2.

3.3.4.4 State Priority Habitats within Vicinity of Build Alternatives

Priority habitats are habitat types or elements with unique or significant value to a diverse assemblage of species (Washington Department of Fish and Wildlife 2012). Table 3.3-5 lists the types of WDFW-designated priority habitats that occur in the study area. The general locations of these priority habitats are mapped on Figures 3.3-1 to 3.3-4 since they provide only generalized habitat information. Illustration of specific WDFW PHS point locations or specialized habitat polygons in public documents is forbidden by WDFW PHS requirements. Further discussion of these habitats follows in Section 3.3.4 Wildlife Habitat and Species by Alternative.

3.3.5 Wildlife Habitat and Species by Alternative

All four alternatives occur in urban environments on sites that contain a mix of developed and vegetated cover types. As such, all sites are expected to be used by the common, adaptable wildlife species found typically in urban King and Snohomish Counties. These include: sparrows, finches, doves, rats, mice, raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), and squirrels. Species such as the American robin *(Turdus migratorius)*, song sparrow *(Melospiza melodia)*, Steller's jay *(Cyanocitta stelleri)*, American crow *(Corvus brachyrhynchos)*, spotted towhee *(Pipilo maculates)*, black-capped chickadee *(Poecile atricapillus)*, white-crowned sparrow *(Zonotrichia leucophrys)*, northern flicker *(Colaptes auratus)*, Bewick's wren *(Thryomanes bewickii)*, and red and white breasted nuthatches *(Sitta spp.)* are also fairly common.

The extent to which these and other species occur on each alternative depends, in part, on the size, type, and distribution of habitat patches, the degree of connectivity and extent of travel corridors between and among these habitats, occurrence of special habitat features (such as snags and down logs), and the amount and type of development and human disturbance at and surrounding the site. Larger habitat patches and those connected to other natural areas or heavily vegetated residential neighborhoods typically support a larger variety of species, including several species of songbirds, and raptors such as American kestrel *(Falco sparverius)*, red-tailed hawk *(Buteo jamaicensis)*, and great horned owl *(Bubo virginianus)*.

Table 3.3-5. WDFW Priority Habitats that Occur in the Study Area

WDFW Priority Habitat Type[a]	WDFW Criteria for Designation as a Priority Habitat Type[1]	Location	Habitat	Corresponding Vegetation Classification Types
Freshwater Wetlands	Comparatively high fish and wildlife density, high fish and wildlife species diversity, important fish and wildlife breeding habitat, important fish and wildlife seasonal ranges, limited availability, high vulnerability to habitat alteration.	Lynnwood Alternative site	Wetland N-1 and immediately adjacent wetlands (N-2; N-3)	UMVD, UMVM
			Wetland around Scriber Lake (1/3 mi NW of site) and downstream along Scriber Creek on opposite (SE) side of I-5.	(outside of study area, but would be UMVD/UMVM)
		BNSF Alternative site	Wetland E2-1[b]	UMVD
			Wetland E2-2[b]	UMVD
			Wetlands to east (E2-3 and E2-5) [b]	UMVD UMVD
			Wetland to north (E2-4) [b]	UMVM USV
			Wetland E2-6 [b]	UMVD
			Wetland E2-7 [b]	
		BNSF Modified Alternative site	Wetland E1-1a and E1-1b[b]	UMVD and USV
			Wetland E2-1[b]	UMVD
			Wetland E2-2[b]	UMVD
			Wetlands to east (E2-3 and E2-5) [b]	UMVD
			Wetland to north (E2-4)[b]	UMVM USV
			Wetland E2-6 [b]	UMVD
			Wetland E2-7 [b]	

WDFW Priority Habitat Type[a]	WDFW Criteria for Designation as a Priority Habitat Type[1]	Location	Habitat	Corresponding Vegetation Classification Types
		520 Alternative site	Wetland E3-1[b]	UMVM
			Wetland E3-2[b]	USV
			Wetland E3-3[b]	USV
			Wetland E3-4[b]	UMVM
			Wetland E3-5[b]	UMVD
		Lynnwood Alternative site	Scriber Lake Park, 0.3 mile northwest of site	"Provides refugia and breeding habitat for lowland, tree-dwelling species."[1]
			Undeveloped site (approx. 15 acres) to the east and across I-5 from site	"Open-space area providing a variety of habitats, mostly forested…includes wetland and riparian areas too small to map individually." [1]
Biodiversity Areas and Corridors	Areas of habitat that are relatively important to various species of native fish and wildlife.			

[a] Source: WDFW PHS database 2012

[b] All vegetated wetlands are by definition WDFW priority habitats (Hruby 2006), although wetlands not large enough to have been inventoried by the National Wetland Inventory or a local inventory are not typically depicted in the PHS database.

The degree to which wetlands are present on or adjacent to each site and the type of wetland (i.e., emergent, scrub-shrub or forested) also helps predict species occurrence. Many amphibian species (i.e., frogs, toads, and salamanders) are dependent upon the occurrence of slow-moving or standing water and narrow stemmed emergent or submersed aquatic vegetation for reproductive needs. Larger wetlands, with flowing water and a forested or scrub-shrub willow and cottonwood component, may provide foraging and denning habitat for beaver (*Castor canadensis*). Wetlands with an emergent component and at least seasonally ponded water typically also support wading birds such as great blue heron, green heron, American bittern (*Botaurus lentiginosus*), as well as songbirds such as red-winged blackbird (*Agelaius phoeniceus*), marsh wren (*Cistothorus palustris*), and winter wren(*Troglodytes hiemalis*).

3.3.5.1 Lynnwood Alternative

In contrast with the other alternative sites, less than half of the Lynnwood Alternative site is currently developed. Approximately 45% of the site is developed while the remainder provides a mix of forested and moderately vegetated habitat. Much of this has been identified as either forested or scrub shrub wetland as well. The northern portion of the site includes approximately 6 acres (11 acres for project limits of Option C2) of UMVD vegetation, which are also part of the Category II wetland associated with Scriber Creek (Wetland N1-1, Figure 3.3-1a). This area was mapped as "Forest" in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013).

According to the City's Comprehensive Plan, Scriber Creek wetland is considered one of the "major" wetlands in the City of Lynnwood (City of Lynnwood 2011). This palustrine forested and scrub-shrub wetland totals approximately 17 acres in size (Sound Transit 2013) and is designated as critical habitat under the City of Lynnwood Municipal Code, Chapter 17.10 and priority habitat by WDFW (Washington Department of Fish and Wildlife 2012).

Habitat features noted in the wetland during the December 5, 2012 site visit included snags with pileated woodpecker activity, willow with signs of beaver activity, and multi-layered vegetation comprised largely of native tree and shrub species. The wetland could be used by a variety of songbirds, raptors, woodpeckers, amphibians, and small mammals. Species observed during the visit include: eastern gray squirrel (*Sciurus carolinensis*), northern flicker, towhee, red-winged blackbird, black-capped chickadee, red-breasted nuthatch (*Sitta canadensis*), song sparrow, house finch (*Carpodacus mexicanus*), purple finch (*Carpodacus purpureus*), crow, and Anna's hummingbird (*Calypte anna*).

Several trees on site likely qualify as "significant trees" under the City of Lynnwood Municipal Code, Chapter 17.15, as they are over 6 inches in diameter and are not species excluded from the definition of a significant tree (i.e., they are not alder, willow, cottonwood, or black locust). They occur within the patches of UMVC, UMVM, and UMVD vegetation (Figure 3.3-1a). The main species likely to meet the definition of a significant tree is Douglas-fir (*Psuedotsuga menziesii*).

The BNSF Storage Tracks component of the Lynnwood Alternative is located in Bellevue in a highly developed area with small patches of UMVM and UMVD distributed throughout the site (Figure 3.3-1b). Small forested, scrub-shrub, and emergent wetlands provide scattered areas of habitat for common urban wildlife species as previously described. The main habitat feature adjacent to this site is the 5.5-acre palustrine, mixed deciduous and coniferous forested wetland (E2-4) located immediately adjacent to the northern extent of the site, two smaller forested/scrub-shrub wetlands

(E2-1 and E2-7), and a narrow emergent wetland (E2-6) each located along the eastern edge of the proposed tracks. Snags in Wetland E2-4 may support foraging by pileated woodpeckers.

3.3.5.2 BNSF Alternative

The BNSF Alternative site is commercially developed (81%), with small patches of UMVM and UMVD (approximately two acres total) distributed throughout the site (Figure 3.3-2). The site is expected to be used by the common urban wildlife species mentioned above. Species observed during the site visit included gulls (flying overhead), crows, black-capped chickadees, gray squirrels and dark-eyed juncos (*Junco hyemalis*).

The main habitat feature adjacent to this site is the 5.5-acre palustrine, mixed deciduous and coniferous forested wetland (E2-4) located immediately adjacent to the northern extent of the site. It contains habitat elements such as large snags and willows and shows signs of use by beaver and woodpeckers. This wetland lies outside and adjacent to the project boundary.

A smaller forested wetland (E2-1) is south of the BNSF spur track from Wetland E2-4 and partially inside the project boundary. Habitat elements observed during the site visit include snags and willows beneath a red alder and black cottonwood forested overstory. Northern flickers were observed using snags, and beaver chew marks were observed on willow stems. The wetland could be used by a variety of songbirds, raptors, woodpeckers, amphibians, and small mammals. A stream with some riparian vegetation (the West Tributary of Kelsey Creek) provides a narrow habitat corridor leading to the southeast to riparian forested Wetland E2-3. Wetland E2-6, a small emergent wetland, is located along the southern portion of the site where it lays along the east side of the existing railroad tracks.

SR 520 to the north and I-405 to the west, along with commercial development to the south and east separate these wetlands from other wetlands and areas of habitat, resulting in a general lack of habitat connectivity for wildlife.

3.3.5.3 BNSF Modified Alternative

The BNSF Modified Alternative site includes most of the area encompassed within the BNSF Alternative site and contains acres of deciduous forest. About 1 acre of this forest also falls within the BNSF Alternative site and the additional 4 acres is situated along the slope west of the former BNSF tracks. The forested slope west of the former BNSF tracks provides habitat value for forest-associated species such as eastern gray squirrels and other small mammals (mice, rats, voles, etc.), songbirds, and raptors. Much of the lower portion of this slope is also categorized as palustrine forested, scrub-shrub, and emergent wetland (Wetland E1-1a), possibly providing habitat for additional species such as Pacific chorus frog (*Pseudacris regilla*) in the ponded portions near its south end. Existing conditions for wildlife are otherwise the same as for the BNSF Alternative.

3.3.5.4 SR 520 Alternative

The SR 520 Alternative is 92% developed, providing habitat only in very small scattered patches for highly adaptable urban wildlife species (Figure 3.3-4). The mixed and deciduous forest habitat (UMVD and UMVM) that exists within the site comprises a total of approximately 0.5 acre of habitat, mainly along the extreme northern edge of the site associated with the SR 520 right-of-way. Although some of this habitat is forested/scrub-shrub/emergent wetland (Wetlands E3-1, E3-4, and E3-5), the understory in most areas is dominated by nonnative Himalayan blackberry, a species that limits habitat value for native wildlife. There is a large patch of undeveloped, forested habitat to the immediate north of the site, but it is separated from the proposed project by SR 520, which forms a wildlife movement barrier. During the December 2012 site visit, two bald eagles were observed soaring over the north end of the site. Several rat traps were observed in parking lots and around buildings, indicating the likely presence of Norway rat (*Rattus norvegicus*) or black rat (*Rattus rattus*). Snags with recent hairy or downy woodpecker (*Picoides villosus* or *Picoides pubescens*) activity exist in the area of UMVD at the northeast corner of the site. Black-capped chickadees were observed in the UMVM habitat along the northern edge of the site. Goff Creek provides a localized source of freshwater for wildlife.

3.4 Wetland Resources

All wetlands in the study area are surrounded by high intensity urban development. Figures 3.4-1 through 3.4-4 illustrate relative location and approximate, undelineated extent of the wetlands identified in the study area based on the field reconnaissance of the wetland study area. Wetlands delineated as part of the East Link (South Bellevue to Overlake) wetland delineation report (Anchor Environmental 2013) are also identified, as well as potential wetlands identified in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013). The majority of the wetlands are located within the project limits of the build alternatives. Wetlands were also found adjacent to the proposed alternative sites in association with Scriber Creek, to the north of the Lynnwood Alternative site, and associated with the West Tributary to Kelsey Creek adjacent to the northern and eastern boundaries of the BNSF Alternative and BNSF Modified Alternative sites. These wetlands are also thus located adjacent to the boundaries of the BNSF Storage Tracks component of the Lynnwood Alternative. The 18 wetlands and three potential wetlands identified in the study area are described in detail in Section 3.4.2.

3.4.1 Analysis of Wetland Determinations

3.4.1.1 Soils

The USDA NRCS soil survey maps for King and Snohomish Counties lists 14 soil series in the study area (Table 3.4-1). Of these 14 series, 5 are classified as hydric soils: Bellingham silt loam, McKenna gravelly silt loam, Mukilteo muck, Seattle muck, and Shalcar muck (U.S. Department of Agriculture 2012 and 2001). All the hydric soils listed in Table 3.4-1 have a seasonal water table that reaches above or just below the surface. Runoff is slow for these soils, and available water capacity is high. In addition, the hazard of stream overflow is severe. Wetlands frequently occur in areas of mapped hydric soils. However, nonhydric soil series can also contain hydric inclusions that have not previously been mapped (i.e., wetlands can occur in soils not mapped as hydric).

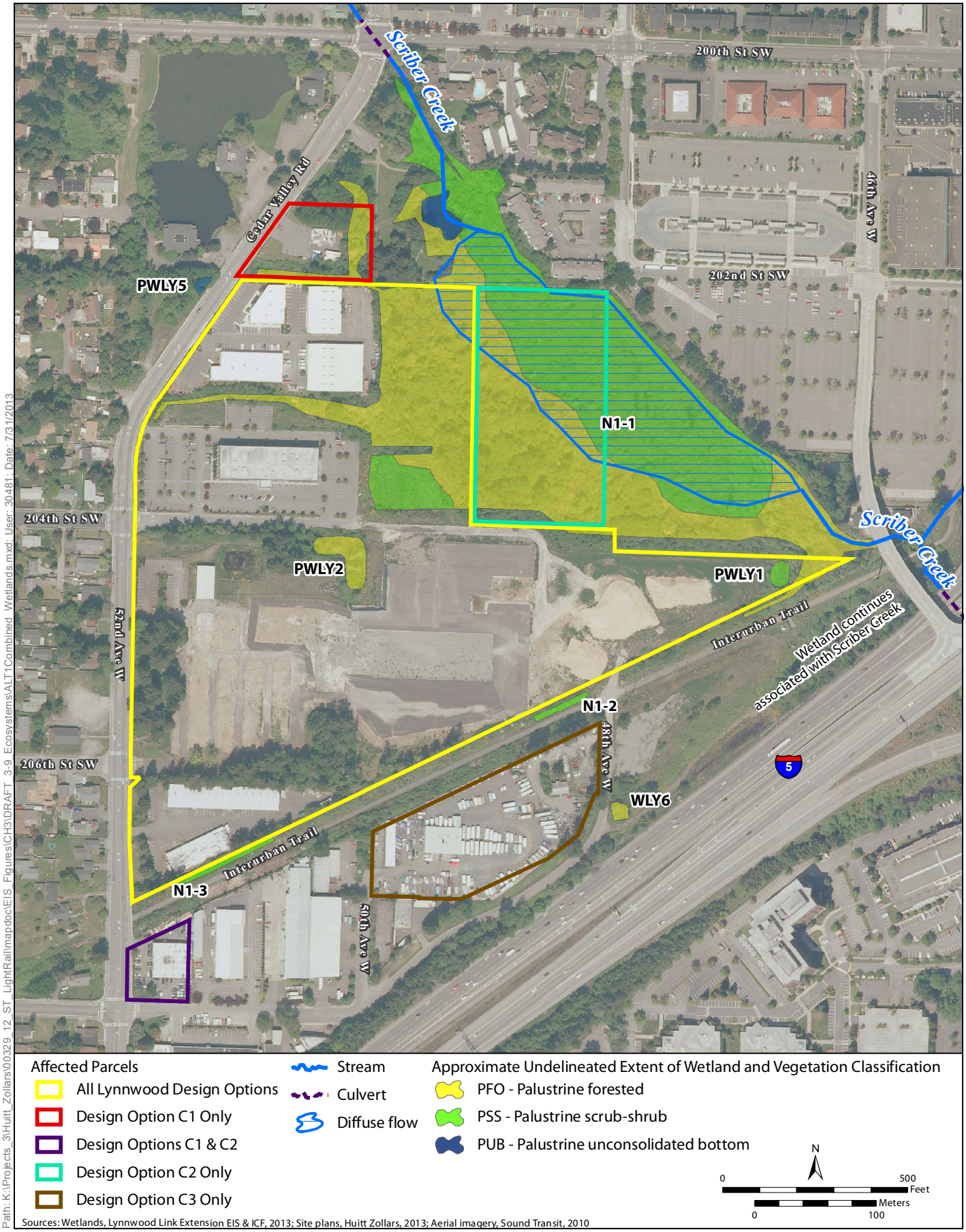

Figure 3.4-1a: Lynnwood Alternative—Wetlands
Ecosystems Technical Report

Figure 3.4-1b: Lynnwood Alternative, BNSF Storage Tracks*—Wetlands Ecosystems Technical Report

*The BNSF Storage Tracks are located in Bellevue

Figure 3.4-2: BNSF Alternative—Wetlands Ecosystems Technical Report

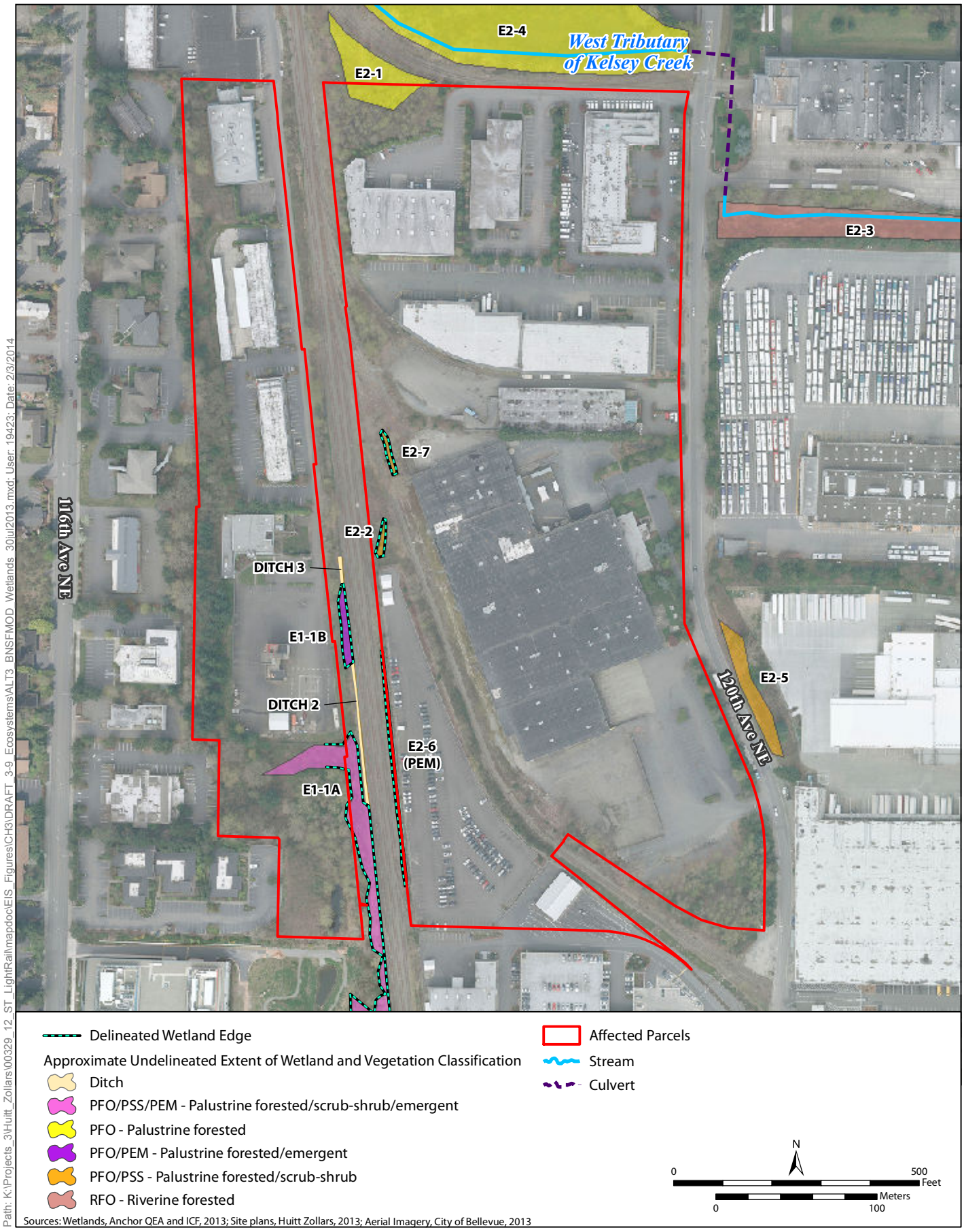

Figure 3.4-3: BNSF Modified Alternative—Wetlands
Ecosystems Technical Report

Figure 3.4-4: SR 520 Alternative—Wetlands
Ecosystems Technical Report

Table 3.4-1. Soils within the Study Area and Hydric Status

Alternative	Soil ID—King and Snohomish Counties	Soil Unit Name and Description[b]	Hydric Status[a]
BNSF, BNSF Modified	AgC	Alderwood gravelly sandy loam 6 – 15% slope	No
BNSF Modified	AgD	Alderwood gravelly sandy loam 15 – 30% slope	No
Lynnwood	5	Alderwood Urban Land Complex, 2 – 8% slope	No
Lynnwood	6	Alderwood Urban Land Complex, 8 – 15% slope	No
BNSF	AmC	Arents, Alderwood material 6 – 15% slope	No
BNSF Modified	Bh	Bellingham Silt Loam	Yes
BNSF Modified	EvC	Everett gravelly sandy loam 5 – 15% slope	No
BNSF	KpB	Kitsap silt loam 2 – 8% slope	No
BNSF, SR 520	KpD	Kitsap silt loam 15 – 30% slope	No
Lynnwood	32	McKenna gravelly silt loam, 0 to 8% slope	Yes
Lynnwood	34	Mukilteo muck	Yes
BNSF, SR 520	Sk	Seattle muck	Yes
BNSF Modified	Sm	Shalcar muck	Yes
All alternatives	Ur/78	Urban Land	No

[a] U.S. Department of Agriculture (USDA). 2012. Natural Resources Conservation Services (NRCS), Web Soil Survey, Soil Data Explorer; and 2001. Hydric Soil Lists, King County Area and Snohomish County Area, October 30, 2001.

[b] Soil descriptions can be found at the King County Conservation District website (http://www.kingcd.org/pub_soil_des.htm), the NRCS Web Soil Survey, Soil Data Explorer (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx).

3.4.1.2 Vegetation

The majority of the wetlands present in each of the build alternative sites are dominated by a mixture of native, hydrophytic plant species typical of wet urban areas in Puget Sound region. The forested wetlands are dominated by red alder (*Alnus rubra*) and black cottonwood (*Populus balsamifera*) trees, with subdominant species including western red cedar (*Thuja plicata*). Understory shrubs typically include mostly salmonberry (*Rubus spectabilis*), red-twig dogwood (*Cornus sericea*), and red elderberry (*Sambucus racemosa*), with Douglas spirea (*Spiraea douglasii*) in areas with more soil saturation. The herbaceous understory is dominated by a mixture of wetland adapted grasses such as bentgrass (*Agrostis* spp.) and fescues (*Festuca* spp.), creeping buttercup (*Ranunculus repens*), lady fern (*Athyrium filix-femina*), and skunk cabbage (*Lysichiton americanum*).

Invasive nonnative and opportunistic native plant species are present typically only in the understory of the smaller wetlands in the alternative sites located in Bellevue. These species tolerate many disturbances and can out-compete less tolerant native species and thus dominate a wetland. This cycle lowers wetland diversity, habitat complexity, and the range and level of functions the

wetland provides. Disturbances that can lead to wetland dominance by invasive nonnative and opportunistic native plant species include altered water regimes, filling, and disturbance to soils.

Nonnative species that are present in the study area include Himalayan blackberry (*Rubus armeniacus*), evergreen blackberry (*Rubus laciniatus*), and reed canarygrass (*Phalaris arundinacea*). Native opportunistic plant species noted include soft rush (*Juncus effusus*) and horsetail (*Equisetum arvense* and *E. telmatiea*). While these species were present in the wetlands, they are generally not dominant components of the vegetation community, with exceptions as noted below in the descriptions of individual wetlands.

3.4.1.3 Hydrology

Surface saturation and/or ponding were readily observable in nearly all of the wetlands at the time of December 2012 site investigation. Although these observations were made outside of the typical growing season and during a seasonal period of typically saturated soil conditions, observations of secondary indicators of hydrology such as flow paths and debris wracking were present to indicate the areas identified as wetlands likely exhibit wetland hydrology during the early portion of the growing season. These field indicators, coupled with observations of topography and characteristic plant communities and inventoried soils, enabled Sound Transit to identify areas that would likely be considered wetlands.

Hydrologic connections between wetlands within the project limits for each alternative and between off site wetland and streams were prevalent in the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites, particularly the BNSF Alternative and SR 520 Alternative sites in which the wetlands contribute water to the West Tributary of Kelsey Creek (BNSF Alternative) and to Goff Creek (SR 520 Alternative).

3.4.1.4 Jurisdictional Determination

Sound Transit has not completed a formal wetland delineation of the wetland areas identified during the field investigation. During permitting of the preferred alternative, Sound Transit will complete wetland delineations and request jurisdictional determinations from the local, state, and/or federal regulatory agencies (as appropriate) of those wetlands that are likely to be affected by the Preferred Alternative. Some jurisdictions may not regulate all the wetlands.

3.4.2 Wetland Descriptions

Table 3.4-2 summarizes the Cowardin class, HGM class, wetland Category based on the *Washington State Wetland Rating System for Western Washington* (Hruby 2006), and associated buffer based on Bellevue or Lynnwood regulations (as applicable) for each of the 18 wetlands and three potential wetlands identified.

Wetlands are classified in terms of the level of wildlife/biological habitat, hydrologic, and water quality function they provide. Sound Transit preliminarily categorized and classified wetlands using Ecology's *Washington State Wetland Rating System for Western Washington* (Hruby 2006) based on characteristics that could be observed during the reconnaissance (e.g., vegetation classes, inlets, outlets) or could be determined from background information sources (e.g., aerial photos). Based on this system, all of the wetlands within the three alternative sites have the "opportunity" to improve water quality and to provide hydrologic functions in the landscape due to their locations in highly

urbanized basins where they receive untreated stormwater discharges and drain to local streams which experience seasonal storm-response flooding.

The degree to which functions are performed by a wetland (e.g., enhancing water quality, reducing floods, and providing fish and wildlife habitat) result in a higher category assignment (Hruby 2006), with Category 1 (I) offering the highest function and Category 4 (IV) offering the lowest. Both Lynnwood and Bellevue have adopted Ecology's rating system without modification as stipulated in their municipal codes and use the system to determine the regulatory category of a wetland, its required compensatory mitigation ratio, and its buffer.

Table 3.4-2. Cowardin Classification, HGM Classifications, Category, and Acreage of Wetlands Located in the Study Area

Wetland ID	Cowardin Class[a]	HGM Class[b]	Category[c]	CAO Buffer Width (feet)[d]	Approximate Total Size (acres)
Lynnwood Alternative					
N1-1/WLY4[e]	PFO1/PSS1/PEM/PUB	Depressional and Riverine	II	110	17+[g]
N1-2	PSS1	Depressional	III	75	0.1
N1-3	PSS1	Depressional	III	75	0.1
WLY6[e]	PFO1	Depressional	III	75	0.05
PWLY1[e]	PSS1	Depressional	III	75	<0.1
PWLY2[e]	PFO1	Depressional	III	75	0.3
PWLY5[e]	PUB	Depressional	III	75	<0.1
Lynnwood Alternative (BNSF Storage Tracks), BNSF Alternative, and BNSF Modified Alternative					
E1-1a	PFO1/PSS1/PEM1	Depressional and Slope	III	60	1.2[g]
E1-1b	PFO1/ PEM1	Depressional	IV	40	0.1
E2-1	PFO1	Depressional	III	60	0.4
E2-2	PFO1/PSS1	Depressional	III	60	<0.1
E2-3	RFO1	Depressional and Riverine	III	60	1.2[g]
E2-4	PFO1/4	Depressional	III	60	5.5
E2-5	PFO1/PSS1	Depressional	IV	40	0.2
E2-6	PEM1	Depressional	III	60	<0.1
E2-7	PFO1/PSS1	Depressional	III	60	<0.1
SR 520 Alternative					
E3-1	PFO1	Depressional	IV	40	0.2
E3-2	REM	Riverine	IV	40	0.2
E3-3	PSS1/PEM1	Depressional	III	60	0.1
E3-4	PFO1	Depressional	III	60	0.1
E3-5	PFO1/PSS1/PEM1	Depressional and Slope	III	60	0.6[g]

[a] *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979): PEM = palustrine emergent marsh; PSS1 = palustrine scrub-shrub, deciduous; PFO1= palustrine forested, deciduous; PFO1/4 = palustrine forested, mixed deciduous and coniferous; REM = riverine, emergent

[b] HGM = hydrogeomorphic classification

Wetland ID	Cowardin Class[a]	HGM Class[b]	Category[c]	CAO Buffer Width (feet)[d]	Approximate Total Size (acres)

[c] Category is based on the *Washington State Wetland Rating System for Western Washington* (Hruby 2006), which the cities of Bellevue and Lynnwood adopted without modification.

[d] Buffer width required by Critical Areas Ordinance for City of Bellevue or Lynnwood, as applicable, based on wetland category and habitat points on the *Washington State Wetland Rating System for Western Washington* (Hruby 2006).

[e] As described in *Lynnwood Link Extension Draft EIS* (Sound Transit 2013)

[f] As described in East Link (South Bellevue to Overlake) wetland delineation report (Anchor Environmental 2013)

[g] Estimated size is approximate; wetland extends outside of study area

3.4.2.1 Wetlands in the Lynnwood Alternative Site

Four wetlands and three potential wetlands were identified in association with the Lynnwood Alternative site. As they were originally associated with the 'northern' alternative, these wetlands were numbered N-1, N-2, and N-3 in the field and are described as such herein. Wetlands reported as part of the Lynnwood Link Extension (Sound Transit 2013) were described in that document as WLY-1, WLY-2 etc. That nomenclature has been retained herein for wetlands and potential wetlands (e.g., PWLY-1) originally described as part of that project.

The Lynnwood Alternative includes a component, the BNSF Storage Tracks, which would be located in Bellevue, along the railroad tracks and an adjacent parcel along 120th Avenue NE. As such, Wetlands E1-1a and E1-1b, E2-1, E2-2, E2-6 and E2-7 are located adjacent to the BNSF Storage Tracks component of the Lynnwood Alternative. These wetlands are described below under the BNSF Alternative and BNSF Modified Alternative.

Wetland N1-1

Wetland N1-1 is located within the eastern portion of the Lynnwood Alternative study area, south of the Scriber Creek culvert at 200th Street SW and 52nd Avenue West (Figure 3.4-1a). This wetland is also described in the *Lynnwood Link Extension Draft EIS* and *Draft Ecosystems Technical Report* (Sound Transit 2013) as Wetland WLY4.

The wetland is an approximately 17-acre (continuing beyond the study area to the southeast), depressional/riverine forested, scrub-shrub, emergent, and unconsolidated bottom (PUB) wetland that occupies a broad depression associated with Scriber Creek and the diffuse flow of the creek through the wetland and continues outside the study area to the southeast associated with the channel of Scriber Creek. It is locally referred to as the Scriber Creek Wetland in the City's Comprehensive Plan and is considered one of the major wetlands in the city of Lynnwood (City of Lynnwood 2011). This wetland is designated as critical habitat under the City of Lynnwood Municipal Code, Chapter 17.10, and priority habitat by WDFW (2012). This wetland is also described by Sound Transit in the *Lynnwood Link Extension Draft EIS* and *Draft Ecosystems Technical Report* (Sound Transit 2013) as Wetland WLY4.

Wetland hydrology is supported by shallow groundwater, flows from Scriber Creek, and surface drainage from nearby lakes. Ponded water persists year-round in several of the deeper open water areas, and during winter months much of the palustrine scrub-shrub area is inundated. Surface waters within the wetland drain to the southeast, forming first a diffuse channel and then the main

channel of Scriber Creek, which enters a 60-inch culvert under I-5 just beyond the southeastern extent of the Lynnwood Alternative limits.

Soils within the outer portion of the Lynnwood Alternative study area occupied by the wetland are mapped as McKenna gravelly silt loam (0–8% slopes); soils within the inner portion of the wetland are mapped as Mukilteo muck. Both soils are listed as hydric soil series (U.S. Department of Agriculture 2012).

Dominant vegetation in the wetland consists of black cottonwood (*Populus balsamifera*, FAC), red alder (*Alnus rubra*, FAC), Sitka spruce (*Picea sitchensis*, FAC), and western red cedar (*Thuja plicata*, FAC) trees, with Himalayan blackberry (*Rubus armeniacus*, FACU), Pacific willow (*Salix lasiandra*, FACW), Douglas spirea (*Spiraea douglasii*, FACW), Pacific crabapple (*Malus fusca*, FACW), red-osier dogwood (*Cornus sericea*, FACW), and Scouler's willow (*Salix scouleriana*, FAC) dominating the diverse shrub understory and scrub-shrub areas near the center of the wetland. The herbaceous layer is dominated by a mixture of native species such as creeping buttercup (*Ranunculus repens,* FACW), lady fern (*Athyrium filix-femina,* FAC), and skunk cabbage (*Lysichiton americanum,* OBL), with some sparse reed canarygrass around the outer edges of the wetland. Wetland buffers are generally vegetated, but narrow, with extensive development limiting buffer widths and vegetation density around the perimeter of the wetland.

The buffers of the two western arms of the wetland appear to have been planted with native trees and shrubs, and are signed with Native Growth Protection Area (NGPA) signs and presence of tie-backs on some of the larger shrubs and small trees suggests these sites were graded and intentionally planted with wetland and wetland buffer vegetation. Data received from the City of Lynnwood indicates buffer averaging occurred in these areas as part of past development applications. Aerial photos indicate that the southwestern corner of the wetland was cleared and graded to create ponded central area around 2002; this portion of the wetland is also ringed by NGPA signs, indicating the grading may also have been related to some type of compensatory mitigation requirement.

Based on its functions (Hruby 2006), this wetland is rated as a Category II wetland (Table 3.4-2).

Wetland N1-2

Wetland N1-2 is located to the north of the Interurban Trail along the south edge of the site (Figure 3.4-1a). The wetland is narrow and confined within a shallow depression adjacent to the paved trail. It is an approximately 0.06-acre, depressional palustrine scrub-shrub wetland.

Wetland hydrology is supported by runoff from the paved trail and rain water which impounds within the depression. The wetland and wetland buffers are located within a managed powerline corridor.

Soils within the portion of the Lynnwood Alternative study area occupied by the wetland are mapped as Alderwood Urban land complex (2–8% slopes), which is not listed as a hydric soil (U.S. Department of Agriculture 2012). Nonhydric soil series can also contain hydric inclusions that have not previously been mapped (i.e., wetlands can occur in soils not mapped as hydric).

Dominant vegetation in the wetland consists of red alder (*Alnus rubra*, FAC) saplings two to four feet high, small willows (*Salix* spp.) and sparse clumps of Douglas spirea (*Spiraea douglasii*, FACW). The outer edges of the wetland and the wetland buffer support Himalayan blackberry (*Rubus armeniacus*, FACU). Wetland buffers are also affected by the paved trail to the south, and by cleared and sparsely vegetated areas to the north.

Based on its functions (Hruby 2006), this wetland is rated as a Category III wetland (Table 3.4-2).

Wetland N1-3

Wetland N1-3 is located to the north of the Interurban Trail along the southwestern edge of the site (Figure 3.4-1a). The wetland is confined within a shallow depression between the north edge of the paved trail and the south of a parking lot. It is an approximately 0.10-acre, depressional palustrine scrub-shrub wetland.

Wetland hydrology is supported by runoff from the paved trail and rain water which impounds within the depression. The wetland and wetland buffers are located within a managed powerline corridor.

Soils within the portion of the Lynnwood Alternative study area occupied by the wetland are mapped as Alderwood Urban land complex (2–8% slopes), which is not listed as a hydric soil (U.S. Department of Agriculture 2012). Nonhydric soil series can also contain hydric inclusions that have not previously been mapped (i.e., wetlands can occur in soils not mapped as hydric).

Dominant vegetation in the wetland consists of small willows (*Salix* spp.) and sparse clumps of Douglas spirea (*Spiraea douglasii*, FACW) interspersed with reed canarygrass (*Phalaris arundinacea*, FACW). The outer edges of the wetland and the wetland buffer support Himalayan blackberry (*Rubus armeniacus*, FACU) and Scot's broom (*Cytisus scoparius*, not listed). Wetland buffers are also affected by the paved trail to the south, and by cleared and sparsely vegetated areas to the north.

Based on its functions (Hruby 2006), this wetland is rated as a Category III wetland (Table 3.4-2).

Wetland WLY6

Wetland WLY6 is located outside and south of the Lynnwood Alternative study area, just south of Wetland N1-2 (Figure 3.4-1a). This wetland is was described in the *Lynnwood Link Extension Draft EIS* and *Draft Ecosystems Technical Report* (Sound Transit 2013) as an approximately 0.05 acre, depressional, palustrine forested wetland.

Wetland hydrology indicators observed included small pockets of inundation and soil saturation. No inlet or outlet was located during the Lynnwood Link Extension field investigation. Wetland WLY6 contains a forested community dominated by Pacific willow (*Salix lucida*, FACW.) and black twinberry (*Lonicera involucrata*, FAC). Other vegetation within the wetland includes red alder (*Alnus rubra*, FAC), Himalayan blackberry (*Rubus armeniacus*, FACU), sedge (*Carex* spp.), lady fern (*Athyrium filix-femina*, FAC), and reed canarygrass (*Phalaris arundinacea*, FACW).

Soils within the portion of the Lynnwood Alternative study area occupied by the wetland are mapped as Alderwood Urban land complex (2–8% slopes), which is not listed as a hydric soil (U.S. Department of Agriculture 2012). Soils documented in the field during the Lynnwood Link Extension field investigation were determined to be hydric (Sound Transit 2013).

The wetland buffer supports black cottonwood (*Populus balsamifera*, FAC) trees, red elderberry (*Sambucus racemosa*, FACU), Himalayan blackberry (*Rubus armeniacus*, FACU) and Scot's broom (*Cytisus scoparius*, not listed). Wetland buffers are also affected by the paved trail to the south, and by cleared and sparsely vegetated areas to the north.

Based on its functions (Hruby 2006), this wetland is rated as a Category III wetland (Table 3.4-2).

Potential Wetlands

Two potential wetlands were described within the Lynnwood Alternative study area and one was described just outside the western boundary of the study area in the *Lynnwood Link Extension Draft EIS* and *Draft Ecosystems Technical Report* (Sound Transit 2013) (Figure 3.4-1a). All are described as Category III wetlands.

Potential wetland PWLY1, located at the southwestern boundary of the study area, is separated from the main body of Wetland N1-1 by a berm. This wetland is described as an approximately 0.07 acre palustrine scrub-shrub wetland.

Potential wetland PWLY2, located in the center of the study area, but outside of publically accessible areas, is separated from the main body of Wetland N1-1 by the entrance road to the nearby development. This wetland is described as an approximately 0.26 acre palustrine forested wetland.

Potential wetland PWLY5 is located across from the western boundary of the study area and is separated from the main body of Wetland N1-1 by Cedar Valley Road. This wetland is described as an approximately 0.03 acre palustrine unconsolidated bottom wetland.

3.4.2.2 Wetlands in the BNSF Alternative Site

Four small, depressional, Category III wetlands were identified within the BNSF Alternative study area; all located east of the railroad tracks. The area east of the railroad tracks is also the eastern portion of the BNSF Modified Alternative study area (Section 3.4.2.3 below). In addition, three wetlands were identified within the 200 foot study area surrounding the BNSF Alternative site.

Because the BNSF Alternative and BNSF Modified Alternative study areas were originally collectively referred to as the E1-E2 alternative, these wetlands were numbered E1-1 (west of the railroad tracks, described in Section 3.4.2.3, Wetlands in the BNSF Modified Alternative Site) and E2-1, E2-2, etc. for wetlands on the east side of the railroad tracks.

Wetland E2-1

Wetland E2-1 is located at the northwestern corner of the site (Figure 3.4-2). This wetland is an approximately 0.36-acre, depressional palustrine forested wetland and is separated from a larger wetland to the north by a rail spur prism. The wetland to the north (E2-4) is a large wetland mapped by the NWI and is associated with the headwaters of the West Tributary of Kelsey Creek.

The south side of Wetland E2-1 is bounded by light industrial development; its western and eastern sides are bounded by railroad tracks. The primary sources of hydrology are groundwater and impounded precipitation.

Soils within the western portion of the wetland are mapped as Kitsap silt loam (15 to 30% slopes); soils of the eastern portion of the wetland are mapped as Seattle muck (a listed hydric soil) (U.S. Department of Agriculture 2012).

Dominant vegetation in the wetland consists of red alder (*Alnus rubra*, FAC) and black cottonwood (*Populus balsamifera*, FAC) trees, with an understory dominated by sparse patches of Douglas spirea (*Spiraea douglasii,* FACW), interspersed with Himalayan blackberry (*Rubus armeniacus*, FACU), and patches of sedge (*Carex* spp.) and soft rush (*Juncus effusus*, FACW). A narrow shrub and tree buffer exists along the wetland's northern point; however the rail and industrial areas limit buffer connectivity to other habitats.

Based on its functions (Hruby 2006), this wetland is rated as a Category III wetland (Table 3.4-2).

Wetland E2-2

Wetland E2-2 is located along the western edge of the site. This wetland is an approximately 0.02-acre, depressional palustrine forested and scrub-shrub wetland located in a depression between the BNSF rail prism and a spur track (Figure 3.4-2). Wetland E2-2 was field delineated (Anchor Environmental 2013) after completion of the *East Link Project Final EIS* (Sound Transit 2011).

Hydric soils were documented and saturation was at the surface and the water table was 1 inch from the surface when delineated (Anchor Environmental 2013).The primary sources of hydrology are groundwater and impounded precipitation. Culverts are located at both the north and south ends of the wetland, the northern culvert connects this wetland with Wetland E2-7 (Anchor Environmental 2013).

Dominant vegetation in the wetland consists of red alder (*Alnus rubra*, FAC) and black cottonwood (*Populus balsamifera*, FAC) trees, with an understory dominated by scattered willow (*Salix* spp.), Douglas spirea (*Spiraea douglasii*, FACW) Himalayan blackberry (*Rubus armeniacus*, FACU), patches of reed canarygrass (*Phalaris arundinacea,* FACW) and sword fern (*Polystichum munitum*, FACU). Water purslane (*Ludwigia palustris*, OBL) was present in the ponded center of the wetland. Very little vegetated buffer remains adjacent to this wetland, and there is no vegetated connectivity to other wetland or upland areas.

Based on its functions (Hruby 2006), this wetland is rated as a Category III wetland (Anchor Environmental 2013) (Table 3.4-2).

Wetland E2-6

Wetland E2-6 is a narrow wetland located along the southwestern edge of the site (Figure 3.4-2). This wetland is an approximately 0.06 acre, depressional palustrine emergent wetland located in a very narrow and highly confined depression between the BNSF rail prism and the toe of the Barrier Motors fill pad. Highly constricted culverts at the wetland's northern and southern ends hydrologically connect it to the stormwater system. Wetland E2-6 was field delineated (Anchor Environmental 2013) after completion of the *East Link Project Final EIS* (Sound Transit 2011).

The primary sources of hydrology are groundwater and impounded precipitation. Hydric soils were documented and 5 inches of surface ponding was present when delineated (Anchor Environmental 2013).Dominant vegetation in the wetland consists of sapling red alder (*Alnus rubra*, FAC) along the outer edges, with common cattail (*Typha latifolia*, OBL), soft rush (*Juncus effusus*, FACW), sparse patches of Douglas spirea (*Spiraea douglasii,* FACW), and reed canarygrass (*Phalaris arundinacea,* FACW) in the deeper portions. Duckweed (*Lemna minor*, OBL) was also present in the ponded center of the wetland. Very little vegetated buffer remains adjacent to this wetland. It appears the buffer has been planted, with Nootka rose (*Rosa nutkana*, FAC) and approximately 10-gallon size Sitka spruce (*Picea sitchensis*, FAC) trees located along portions of its northeastern edge. There is no vegetated connectivity to other wetland or upland areas.

Based on its functions (Hruby 2006), this wetland is rated as a Category III wetland (Anchor Environmental 2013) (Table 3.4-2).

Wetland E2-7

Wetland E2-7 is located along the western edge of the site. This wetland is an approximately 0.02-acre, depressional palustrine forested and scrub-shrub wetland located in a depression between the BNSF rail prism and a spur track (Figure 3.4-2). Confined inlets and outlets at both the northern and southern ends connect this wetland to the stormwater system; the southern culvert connects this wetland to Wetland E2-2. Wetland E2-7 was field delineated (Anchor Environmental 2013) after completion of the *East Link Project Final EIS* (Sound Transit 2011).

The primary sources of hydrology are groundwater and impounded precipitation. Hydric soils were documented and soil saturation was present when delineated (Anchor Environmental 2013).

Dominant vegetation in the wetland consists of 10- to 16-inch dbh black cottonwood (*Populus balsamifera*, FAC) trees along its eastern edge, with a very sparse understory dominated by willow (*Salix* spp.), Himalayan blackberry (*Rubus armeniacus*, FACU), bittersweet nightshade (*Solanum dulcamara*, FAC) and patches of reed canarygrass (*Phalaris arundinacea,* FACW). One snag and several downed logs are present in the wetland. Very little vegetated buffer remains adjacent to this wetland, and there is no vegetated connectivity to other wetland or upland areas.

Based on its functions (Hruby 2006), this wetland is rated as a Category III wetland (Anchor Environmental 2013) (Table 3.4-2).

Adjacent Wetlands

Wetland E2-3

Wetland E2-3 is located outside of the BNSF Alternative site, but within the wetland study area to the east of 120th Avenue NE. Wetland E2-3 was referred to by Sound Transit as *Wetland WR-8NW, West Tributary to Kelsey Creek Riparian Wetland* in the *East Link Project Final EIS* (Sound Transit 2011). However, this wetland was not delineated as it ultimately fell outside of the project's specific study area (Anchor Environmental 2013).

The wetland is an approximately 1.2-acre, riverine forested wetland which forms the narrow vegetated fringe along the West Tributary of Kelsey Creek. The West Tributary of Kelsey Creek flows from the northwest into the wetland from a culvert under 120th Avenue NE. The West Tributary of Kelsey Creek originates from within its headwater wetland (Wetland E2-4, described below), located to the west of 120th Avenue NE and adjacent to the northern boundary of the BNSF Alternative site (Figure 3.4-2).

The primary sources of hydrology are groundwater and precipitation along with regular seasonal overbank flows from the creek. Soils within the wetland are mapped as Seattle muck, a listed hydric soil (U.S. Department of Agriculture 2012).

The dominant vegetation in the wetland consists of large black cottonwood (*Populus balsamifera*, FAC) and red alder (*Alnus rubra*, FAC) trees, with an understory of red-osier dogwood (*Cornus sericea*, FACW), reed canarygrass (*Phalaris arundinacea*, FACW), and Himalayan blackberry (*Rubus armeniacus*, FACU). Scattered holly (*Ilex aquifolium*, not listed) and sword fern *(Polystichum munitum*, FACU) are also present near the wetland's outer edges. The vegetated buffer is limited to a very narrow strip paralleling the creek and wetland, and is also limited to the west by the 120th Avenue NE road prism.

This wetland was rated as a Category III wetland in the Sound Transit *East Link Project Final EIS* (Sound Transit 2011). Data collected during the current field reconnaissance confirmed site conditions similar to that noted in 2011. Based on its functions (Hruby 2006), this wetland is rated as a Category III wetland (Table 3.4-2).

Wetland E2-4

Wetland E2-4 is located outside of the BNSF Alternative site, but within the wetland study area to the north of the site and north of a rail spur (Figure 3.4-2). The wetland forms the headwaters of the West Tributary of Kelsey Creek. The wetland is an approximately 5.5 acre, depressional palustrine forested wetland located in a depression between rail prisms to the south and west, 120th Avenue NE to the east, and the Lowes Home Improvement store to the north. The West Tributary of Kelsey creek flows out of the wetland at its southeastern corner and then enters a culvert under 120th Avenue NE which flows into Wetland E2-3 to the east.

The primary sources of hydrology are groundwater and precipitation along with regular seasonal overbank flows from the creek. Soils within the wetland are mapped as Seattle muck, a listed hydric soil (U.S. Department of Agriculture 2012).

The dominant vegetation in the wetland consists of large black cottonwood (*Populus balsamifera*, FAC) and red alder (*Alnus rubra*, FAC) trees, with western red cedar (*Thuja plicata*, FAC) trees present in the understory. The shrub layer is dominated by understory of Douglas spirea (*Spiraea douglasii*, FACW), willow (*Salix* spp.), soft rush (*Juncus effusus*, FACW). Reed canarygrass (*Phalaris arundinacea*, FACW), Himalayan blackberry (*Rubus armeniacus*, FACU), scattered holly (*Ilex aquifolium*, not listed) and sword fern *(Polystichum munitum*, FACU) are also present near the wetland's outer edges. The vegetated buffer is limited by the rail prism, road, and the adjacent retail development.

Based on its functions (Hruby 2006), this wetland is rated as a Category III wetland (Table 3.4-2).

Wetland E2-5

Wetland E2-5 is located outside of the BNSF Alternative site, but within the wetland study area to the east of the southeastern corner of the site (Figure 3.4-2). This wetland is an approximately 0.2-acre, depressional palustrine forested and scrub shrub wetland located in a confined depression between the eastern side of 120th Avenue NE and the toe of the retaining wall of the adjacent development to the east. Confined inlets and outlets connect this wetland to the stormwater system, including a narrow ditch conveying water from the north into the wetland.

The primary sources of hydrology are groundwater and impounded precipitation. Soils within the wetland are mapped as Urban Land, which is not a listed hydric soil (U.S. Department of Agriculture 2012). Nonhydric soil series can also contain hydric inclusions that have not previously been mapped (i.e., wetlands can occur in soils not mapped as hydric).

Dominant vegetation in the forested portion of the wetland consists of large red alder (*Alnus rubra*, FAC), black cottonwood (*Populus balsamifera*, FAC), and Pacific willow (Salix lasiandra, FACW) trees, with a fairly dense understory dominated by Douglas spirea (*Spiraea douglasii*, FACW), willow (*Salix* spp.), small-fruited bulrush (*Scirpus microcarpus*, FACW), Himalayan blackberry (*Rubus armeniacus*, FACU), soft rush (*Juncus effusus*, FACW), and patches of reed canarygrass (*Phalaris arundinacea,* FACW) and creeping buttercup (*Ranunculus repens*, FACW). The southern scrub-shrub portion of the

wetland is dominated by Douglas spirea (*Spiraea douglasii*, FACW). Several downed logs are present in the wetland. Very little vegetated buffer remains adjacent to this wetland, and there is no vegetated connectivity to other wetland or upland areas.

Based on its functions (Hruby 2006), this wetland is rated as a Category III wetland (Table 3.4-2).

3.4.2.3 Wetlands in the BNSF Modified Alternative Site

Four of the five wetlands in the BNSF Modified Alternative site (Wetland E2-1, E2-2, E2-6 and E2-7), and the three wetlands adjacent to the site (Wetland E2-3, E2-4, and E2-5), are described in detail in Section 3.4.2.2 above.

Two additional wetlands (E1-1a and E1-1b) and two connecting ditches lie along the western side of the railroad tracks, and are encompassed within the BNSF Modified Alternative site configuration. Because this alternative was originally referred to as the E1 alternative, these wetlands are numbered E1-1a and E1-1b. Wetland E1-1a was referred to by Sound Transit as *Wetland WR-6, BNSF Matrix Wetland* in the *East Link Project Final EIS* (Sound Transit 2011); portions of the wetland were ultimately delineated as Wetland BNSF West (Anchor Environmental 2013); Wetland E1-1b was ultimately delineated as Wetland BNSF Northwest (Anchor Environmental 2013).

Wetland E1-1a

Wetland E1-1a is a long, generally narrow wetland located along the eastern edge of the western portion of the BNSF Modified Alternative site, adjacent to the BNSF rail prism (Figure 3.4-3). This wetland is an approximately 1. 2-acre, depressional and slope, forested, scrub-shrub, and emergent wetland. Wetland E1-1a continues outside of the study area to the south as a forested community and connects via Ditch #2 (described below) along the railroad tracks to Wetland E1-1b to the north.

Water in this depression generally flows from south to north at its northern end. However water in the southern portion of the depression was observed flowing north to south via a ditch into another forested wetland outside of the study area, indicating the basin boundary between the West Tributary of Kelsey Creek and Sturtevant Creek may occur near the southern portion of this wetland. Groundwater seeps and impounded precipitation are the primary sources of hydrology. Water in the western sloped portion of the wetland flows out of the forested slope and down into the depressional portion of the wetland adjacent to and along the railroad tracks. The scrub-shrub and emergent portions of the wetland lie in a very narrow depression, between the adjacent access road and associated light industrial buildings and parking lots and the BNSF rail prism.

The primary sources of hydrology are groundwater seeps and impounded precipitation. Hydric soils were documented and soil saturation was present when delineated (Anchor Environmental 2013).Dominant vegetation in the forested portion of the wetland consists of large red alder (*Alnus rubra*, FAC), black cottonwood (*Populus balsamifera*, FAC), and Pacific willow (*Salix lasiandra*, FACW) trees, with a dense understory dominated by salmonberry (*Rubus spectabilis*, FACW), Douglas spirea (*Spiraea douglasii*, FACW), willow (*Salix* spp.), Himalayan blackberry (*Rubus armeniacus*, FACU), soft rush (*Juncus effusus*, FACW), and patches of reed canarygrass (*Phalaris arundinacea,* FACW). The scrub-shrub portion of the wetland is dominated by willow (*Salix* spp.), sapling red alder (*Alnus rubra*, FAC), and Douglas spirea (*Spiraea douglasii*, FACW), interspersed with reed canarygrass (*Phalaris arundinacea,* FACW), common cattail (*Typha latifolia*, OBL), and soft rush ((*Juncus effusus*, FACW). The emergent portions of the wetland are dominated by common

cattail (*Typha latifolia*, OBL), soft rush ((*Juncus effusus*, FACW), curly dock (*Rumex crispus*, FAC), and patches of reed canarygrass (*Phalaris arundinacea,* FACW).

Very little vegetated buffer remains adjacent to the eastern side of this wetland, but there is limited vegetated connectivity to other wetland and upland areas to the west and south of the site. The western buffer is densely vegetated with mature trees and a dense, predominately native understory on the slope. As the wetland narrows into the rail-side depression, its buffers consist of a very narrow fringe of Himalayan blackberry.

In January 2008 the Watershed Company (2008) conducted a wetland delineation study for the Seattle Children's Hospital project that has been constructed and is now operating immediately south of the southwestern portion of the site. The Watershed Company (2008) rated this wetland as Category III. Sound Transit also rated this as a Category III wetland (Hruby 2006) based on its functions (Anchor Environmental 2013).

Wetland E1-1b

Wetland E1-1b is a small, generally narrow wetland located along the eastern edge of the western portion of the BNSF Modified Alternative site, adjacent to the BNSF rail prism and north of Wetland E1-1a (Figure 3.4-3). This wetland is an approximately 0.06-acre, depressional, forested and emergent wetland. Water from Wetland E1-1b flows via Ditch #3 (described below) along the railroad tracks north and outside of the study area (Anchor Environmental 2013). Portions of Wetland E1-1b are also encompassed within the BNSF Storage Tracks portion of the Lynnwood Alternative.

The primary sources of hydrology are seasonal flow from Wetland E1-1a and impounded precipitation. Hydric soils were documented and soil saturation was present when delineated (Anchor Environmental 2013).

Dominant vegetation in the forested portion of the wetland consists of scattered Pacific willow (*Salix lasiandra*, FACW) trees, with an understory dominated by Douglas spirea (*Spiraea douglasii*, FACW), Himalayan blackberry (*Rubus armeniacus*, FACU), soft rush (*Juncus effusus*, FACW), and areas of English ivy (*Hedera helix*, not rated).

Very little vegetated buffer remains adjacent to either side of this wetland, but there is limited vegetated connectivity to other wetland and upland areas to the north and south. As the wetland narrows into the rail-side depression, its buffers consist of a very narrow fringe of Himalayan blackberry.

Sound Transit rated this as a Category IV wetland (Hruby 2006) based on its functions (Anchor Environmental 2013).

Jurisdictional Ditches

Two ditch features (Ditch #2 and #3) were identified within the BNSF Modified Alternative study area by Sound Transit during the East Link South Bellevue to Overlake delineations (Anchor Environmental 2013) as potential Waters of the United States (i.e., not wetlands or streams, but drainage features that convey water to a wetland or stream that is regulated under the Clean Water Act). Such features may be federally regulated by the Corps. One additional ditch (Ditch #1) was also identified, but is located south of the southern end of Wetland E1-1a and well outside the study area (Anchor Environmental 2013).

Ditch #2

Ditch #2 extends from the north end of Wetland E1-1a to Wetland E1-1b along the western side of the railroad tracks (Figure 3.4-3). The ditch is approximately 293 feet long and ranges in width from approximately 2 to 4 feet. Jurisdictional characteristics observed included bed and bank scour, flattened vegetation, standing and flowing water, and water stains on rocks within the ditch (Anchor Environmental 2013). Water from this ditch ultimately enters the West Tributary of Kelsey Creek via culverts (Anchor Environmental 2013).

Ditch #3

Ditch #3 extends from the north end of Wetland E1-1b along the western side of the railroad tracks (Figure 3.4-3). The portion of the ditch delineated within the study area is approximately 56 feet long and ranges in width from approximately 2 to 3 feet. The ditch appears to continue north along the railroad tracks past the northern end of the BNSF Modified Alternative study area. Jurisdictional characteristics observed included bed and bank scour, flattened vegetation, standing and flowing water, and water stains on rocks within the ditch (Anchor Environmental 2013). Water from this ditch ultimately enters the West Tributary of Kelsey Creek via culverts (Anchor Environmental 2013).

3.4.2.4 Wetlands in the SR 520 Alternative Site

Five wetlands and two ditches were identified within or immediately adjacent to the northern boundary of the SR 520 Alternative site. Because this alternative was originally referred to as the E3 alternative, these wetlands were numbered E3-1, E3-2, etc.

Wetland E3-2

Wetland E3-2 is located along within southwestern portion of the site. The wetland is associated with the channel of Goff Creek as it flows adjacent to NE 20th Street, and is bounded by paved sidewalks and road prisms (Figure 3.4-3). The wetland is an approximately 0.21-acre, riverine emergent wetland that is supported by overflow from Goff Creek. The wetland area drains to the east and into a stormwater ditch then into a culvert under NE 20th Street. This wetland is illustrated as 'wetland/stream buffer' on figures within the *East Link Project Final EIS* (Sound Transit 2011), but is not specifically described.

Soils within the portion of the SR 520 Alternative study area occupied by the wetland are mapped as Everett gravelly sandy loam (5–15% slopes), which is not listed as a hydric soil (U.S. Department of Agriculture 2012). Nonhydric soil series can also contain hydric inclusions that have not previously been mapped (i.e., wetlands can occur in soils not mapped as hydric).

Vegetation in the wetland has been altered by landscaping and mowing. Dominant vegetation in the wetland consists of creeping buttercup (*Ranunculus repens*, FACW), reed canarygrass (*Phalaris arundinacea*, FACW), mannagrass (*Glyceria* spp.), mowed lawn grass, dock (*Rumex* spp.), and watercress (*Nasturtium officinale*, OBL). Lawn grass and landscape plantings form the vegetated buffer surrounding this wetland.

Based on its functions (Hruby 2006), this wetland is rated as a Category IV wetland.

Wetland E3-3

Wetland E3-3 is located within the southern portion of the site (Figure 3.4-3). The wetland is confined within a stormwater ditch located at the toe of the northern edge of NE 20th Street, and is bounded by vertical concrete walls. The wetland is an approximately 0.11-acre, depressional palustrine emergent and scrub-shrub wetland that is supported by groundwater and stormwater from the parking lots to the north. The wetland flows into a storm drain and appears to connect with Goff Creek which ultimately flows to the south via a culvert under NE 20th Street. This wetland is illustrated as 'wetland/stream buffer' on figures within the *East Link Project Final EIS* (Sound Transit 2011), but is not specifically described.

Soils within the portion of the SR 520 Alternative study area occupied by the wetland are mapped as Everett gravelly sandy loam (5–15% slopes), which is not listed as a hydric soil (NRCS 2012). Nonhydric soil series can also contain hydric inclusions that have not previously been mapped (i.e., wetlands can occur in soils not mapped as hydric).

This wetland appears to have been intentionally planted, possibly as a wetland or stream mitigation for impacts associated with development in the Goff Creek basin. This conclusion is based on the variety, spacing, and size of the shrubs and the presence of tie-backs on some of the larger shrubs and small trees, and the presence of Native Growth Protection Easement (NGPE) signs around the edge of the wetland.

The dominant herbaceous vegetation in the wetland consists of reed canarygrass (*Phalaris arundinacea*, FACW), soft rush (*Juncus effusus*, FACW), watercress (*Nasturtium officinale*, OBL), and creeping buttercup (*Ranunculus repens*, FACW). Scrub-shrub vegetation includes Douglas spirea (*Spiraea douglasii*, FACW), willow (*Salix* spp. FACW), and red-osier dogwood (*Cornus sericea*, FACW). A very narrow buffer strip along the north edge of the wetland has been planted with native shrubs, including snowberry (*Symphoricarpos albus*, FACU) and vine maple (*Acer circinatum*, FACU). No buffer exists to the south which is bounded by NE 20th Street.

Based on its functions (Hruby 2006), this wetland is rated as a Category III wetland.

Wetland E3-5

Wetland E3-5 is located along the northern edge of the site and to the east of Wetland E3-4 (Figure 3.4-3). The extreme western corner of the wetland lies within the SR 520 Alternative site boundary. The wetland occupies an approximately 600+-foot long linear bench in a forested slope adjacent to SR 520 and continues to the east outside of the study area. The wetland is an approximately 0.55 acre, depressional and slope wetland. The wetland supports palustrine forested, scrub-shrub, and emergent vegetation classes that are supported by seeps along the slope. This wetland is described as Wetland WR-11 West of 140th Avenue NE by Sound Transit in the *East Link Project Final EIS* (Sound Transit 2011) and was delineated as Wetland SR 520 West (Anchor Environmental 2013).

The primary sources of hydrology are seasonal seeps and impounded precipitation. Hydric soils were documented and soil saturation was present when delineated (Anchor Environmental 2013).

Dominant vegetation in the wetland consists of large black cottonwood (*Populus balsamifera*, FAC), trees, interspersed with smaller red alder (*Alnus rubra*, FAC) trees and an understory dominated by red-osier dogwood (*Cornus sericea*, FACW), willow (*Salix* spp. FAC), Douglas spirea (*Spiraea douglasii*, FACW), and Himalayan blackberry (*Rubus armeniacus*, FACU), with skunk cabbage (*Lysichiton americanum*, OBL), and water parsley (*Oenanthe sarmentosa*, OBL) in the emergent, off

site, areas and sword fern (*Polystichum munitum*, FACU) present along the edges of the wetland. The wetland buffer is limited to the linear margins adjacent to SR 520 to the north and the parking lots to the south.

Based on its functions (Hruby 2006), this wetland was rated as a Category III wetland (Anchor Environmental 2013).

Adjacent Wetlands

Wetland E3-1

Wetland E3-1 is located just outside the SR 520 Alternative site, along its northern edge (Figure 3.4-3). The wetland occupies an approximately 800-foot long linear bench along the forested slope adjacent to SR 520. Wetland E3-1 is an approximately 0.23-acre, depressional palustrine forested wetland that seems to be hydrologically supported by seeps along the slope. Water from these seeps ponds in the wetland and then flows through the riprap retaining wall along the southern toe of the slope and onto the paved parking area and into storm drains; the western end of the wetland also flows directly into Goff Creek. This wetland is not described by Sound Transit in the *East Link Project Final EIS* (Sound Transit 2011).

Soils within the portion of the SR 520 Alternative study area occupied by the wetland are mapped as Everett gravelly sandy loam (5% to 15% slopes), which is not listed as a hydric soil (U.S. Department of Agriculture 2012). Nonhydric soil series can also contain hydric inclusions that have not previously been mapped (i.e., wetlands can occur in soils not mapped as hydric).

Dominant vegetation in the wetland consists of large black cottonwood (*Populus balsamifera*, FAC), and Pacific willow (*Salix lasiandra*, FACW) trees, interspersed with smaller red alder (*Alnus rubra*, FAC) trees and an understory dominated by Himalayan blackberry (*Rubus armeniacus*, FACU), and Scouler's willow (*Salix scouleriana*, FAC), with common horsetail (*Equisetum arvense*, FAC) and watercress (*Nasturtium officinale*, OBL) present in the wettest eastern portion of the wetland. The wetland buffer is limited to the linear margins adjacent to I-520 to the north and the parking lots to the south.

Based on its functions (Hruby 2006), this wetland is rated as a Category IV wetland.

Wetland E3-4

Wetland E3-4 is located just outside the SR 520 Alternative site, along its northern edge and to the east of Wetland E3-1(Figure 3.4-3). The wetland occupies an approximately 150-foot long linear bench in a forested slope adjacent to SR 520. The wetland is an approximately 0.07-acre, depressional palustrine forested wetland that seems to be supported by seeps along the slope. Water from these seeps likely flow into the storm drain system associated with the parking lots to the south of the wetland. This wetland is not described by Sound Transit in the *East Link Project Final EIS* (Sound Transit 2011).

Soils within the portion of the SR 520 Alternative study area occupied by the wetland are mapped as Alderwood gravelly sandy loam (6–15% slopes), which is not listed as a hydric soil (NRCS 2012). Nonhydric soil series can also contain hydric inclusions that have not previously been mapped (i.e., wetlands can occur in soils not mapped as hydric).

Dominant vegetation in the wetland consists of black cottonwood (*Populus balsamifera*, FAC) trees, interspersed with smaller red alder (*Alnus rubra*, FAC) trees and an understory dominated by Himalayan blackberry (*Rubus armeniacus*, FACU), with common horsetail (*Equisetum arvense*, FAC) present in the wettest portions of the wetland. The wetland buffer is limited to the linear margins adjacent to I-520 to the north and the parking lots to the south.

Based on its functions (Hruby 2006), this wetland is rated as a Category III wetland.

Jurisdictional Ditches

Two ditch features within the SR 520 Alternative study area have been classified as potential Waters of the U.S. (i.e., not wetlands or streams, but drainage features that convey water to a wetland or stream). Such features may be federally regulated by the Corps.

Ditch #1

Ditch #1 within the 520 Alternative site is located in the west-central portion of site, approximately 460 feet to the east of and flowing parallel to Goff Creek (Figure 3.4-4). Groundwater emerges from a pipe under the parking lot on the north end of the site and flows through an approximately 6-foot-wide, 3-foot-deep, and approximately 226-foot-long swale that conveys flowing water south. Typical surface flows are conveyed by a 12- to 18-inch-wide swale running down the middle of the feature for approximately 91 feet into a grated drain that empties into a stormwater vault. Another 135 feet of swale provides high-flow bypass, conveying flows to the stormwater system. The vault appears to empty into Wetland E3-3 along NE 20th Street through a culvert pipe underneath the surrounding commercial property, but this pipe could also bypass the wetland and drain directly into municipal stormwater infrastructure underground. The source of groundwater conveyed in Water of the U.S. #1 is unclear as there are no surface channels, culverts or other conveyance features linked directly to its upstream end other than parking lot stormwater drains. There is evidence of considerable groundwater influence at the west end of the site (e.g., upslope wetlands, water seeping through pavement cracks), suggesting that this feature receives a majority of its flow as groundwater discharge from under the site.

Jurisdictional characteristics observed included bed and bank scour, flattened vegetation, standing and flowing water, and water stains on rocks within the ditch. If this feature does connect to Wetland E3-3, it could be considered a regulated water by the Corps under the Clean Water Act because Wetland E3-3 appears to be connected to Goff Creek via culverts.

Downstream-facing View of Ditch #1, Including Surface Flow and Piped Segments.

Ditch #2

Ditch #2 is a shallow, V-shaped open ditch approximately three-feet wide and 20 feet long. It is integrated into ornamental landscaping near the second driveway (from the west) entering the central portion of the commercial development and parking lots along NE 20th Street (Figure 3.4-4). The surface swale within this ditch is a partially-vegetated, rock lined swale approximately eighteen-inches wide at its widest point and ranging from near zero (subsurface flow) to two-inches deep. The flow drains to the south and enters a driveway culvert that appears to drain into Wetland E3-3. Water is conveyed into this feature from a partially buried pipe that could not be traced to any evident surface drainage features. The lack of an evident upstream surface water source suggests that Water of the U.S. #2 is also groundwater fed.

Jurisdictional characteristics observed included bed and bank scour, flattened vegetation, standing and flowing water, and water stains on rocks within the ditch. If this feature does connect to Wetland E3-3, it could be considered a regulated water by the Corps under the Clean Water Act because Wetland E3-3 appears to be connected to Goff Creek via culverts.

3.4.3 Wetland Mapping

The 18 wetlands and three potential wetlands identified during the field reconnaissance are expected to be jurisdictional wetlands regulated by the local jurisdictions, Department of Ecology, and/or the Corps. It is possible that the Corps would also regulate impacts on the ditches identified within the BNSF Alternative and SR 520 Alternative based on their hydrologic connections to other jurisdictional features (i.e., Wetland E3-3). Figures 3.4-1 through 3.4-4 illustrate the location and extent of the six wetlands and two ditches delineated within the BNSF Alternative and 520 Alternative for the East Link project (Anchor Environmental 2013) and approximate, unsurveyed extent of the 12 wetlands and the two ditches in the other study areas. The location and approximate extent of these features in association with the location and configuration of the proposed project under each of the four alternatives is presented in Chapter 4.

3.4.4 Wetland Ratings and Function Assessment

3.4.4.1 Wetland Rating and Regulatory Category

Table 3.4-3 presents the score for water quality improvement function, hydrologic function, and habitat function for each of the 18 wetlands identified in the study area and presents the wetland's regulatory category based on these functions as derived from the *Washington State Wetland Rating System for Western Washington* (Hruby 2006). The 'potential' score is a measure of the specific characteristics of a wetland relative to being able to provide the function. The 'opportunity' score is a measure of the 'value' of that function in the context of the character and degree of urbanization of a wetland's watershed. Wetlands in highly urbanized watersheds have a greater 'opportunity' to provide water quality improvement and hydrologic functions because they are located in areas that have stormwater pollution, flooding, and erosion problems. Habitat function is similarly rated on the specific characteristics of the wetland relative to its plant community, number of hydroperiods, and special habitat features (i.e., its habitat potential) and on its buffer conditions and corridors and connectivity to other quality habitats (i.e., its habitat opportunity).

The functions performed by each wetland vary according to the nature of its outlet, the degree of vegetation and ponding within the wetland, it's location in the landscape, the nature of surrounding land use activities and their influence on the quality of the wetland buffer, and the proximity of the wetland to other wetlands and areas of habitat in the landscape. For example, wetlands without an outlet (e.g., Wetland E2-1 at the northern end of the BNSF Alternative and BNSF Modified Alternative sites) are considered to have higher 'potential' to provide water quality and hydrologic (i.e., reduction in flooding and erosion) functions than wetlands with outlets (e.g., culverts). Such wetlands hold stormwater that would otherwise be carried downstream to local streams, lakes, and Puget Sound.

Table 3.4-3. Functions of Wetlands within the Project Study Area Based on Wetland Rating System

Wetland ID	Water Quality Functions—Qualitative Rating (numerical score in parentheses)[a]		Hydrologic Functions—Qualitative Rating (numerical score in parentheses)[a]		Habitat Functions—Qualitative Rating (numerical score in parentheses)[a]		Total Score	Category[b]
	Potential	Opportunity	Potential	Opportunity	Potential	Opportunity		
N1-1	18	Yes	20	Yes	12	9	59	II
N1-2	20	Yes	14	Yes	1	6	41	III
N1-3	20	Yes	14	Yes	1	5	40	III
WLY6[c]	24	Yes	7	No	4	4		III
E1-1a[d]	14	Yes	16	Yes	8	4	42	III
E1-1b[d]	8	Yes	6	Yes	6	4	24	IV
E2-1	16	Yes	8	Yes	3	5	32	III
E2-2[d]	14	Yes	16	Yes	6	4	40	III
E2-3	20	Yes	18	Yes	6	3	47	III
E2-4	18	Yes	10	Yes	7	5	40	III
E2-5	14	Yes	4	Yes	6	3	27	IV
E2-6[d]	14	Yes	16	Yes	7	4	37	III
E2-7[d]	14	Yes	16	Yes	6	4	40	III
E3-1	14	Yes	4	Yes	3	4	25	IV
E3-2	4	Yes	12	Yes	3	3	22	IV
E3-3	18	Yes	10	Yes	5	3	36	III
E3-4	16	Yes	8	Yes	2	4	30	III
E3-5[d]	18	Yes	16	Yes	9	5	48	III

[a] See Table 3.4-4 for definitions of qualitative grouping of wetland functions

[b] Category is based on the *Washington State Wetland Rating System for Western Washington*(Hruby 2006), which the cities of Bellevue and Lynnwood adopted without modification.

[c] The rating form was completed for Wetland WLY6 as part of the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013).

[d] The rating forms for these wetlands were completed as part of the East Link South Bellevue to Overlake wetland delineation (Anchor Environmental 2013).

Wetlands, with or without outlets, which occur in landscapes that are urbanized and developed (i.e., where pollutants are present) have an 'opportunity' to provide water quality improvement functions. Similarly, wetlands which occur within basins in which local streams and rivers flood causing damage to infrastructure, property, and natural resources such as salmonid spawning areas, have the 'opportunity' to provide hydrologic functions to reduce flood flows and erosion. These 'opportunities' increase a wetland's score for these function and results in a higher overall score (and thus a higher Category) than wetlands that lack such 'opportunities'. Given the urbanized nature of all of the build alternative sites and their drainage basins, all of the wetlands received the opportunity' multiplier for their water quality and hydrologic function scores (Table 3.4-4).

Wetlands which have a diversity of vegetation classes (e.g., forested, scrub-shrub, and emergent) interspersed with each other, which have a diversity of native plant species and habitat features such as snags and downed logs, and which are located in proximity to other wetlands, large lakes or Puget Sound have a high habitat function for wildlife. Wetland N1-1, the Scriber Creek wetland in

the Lynnwood Alternative site is an example of such a wetland. Wetland habitat function is also affected by the condition of the wetland's buffer, with wetlands having wider, more densely vegetated buffers scoring higher than wetland's whose buffer contains roads, paved trails, buildings and other areas which enable human disturbance of wildlife. Because each of the proposed build alternatives is located in urban areas with high levels of infrastructure, the buffers of all of the wetlands are degraded. Some wetlands such as Wetlands E2-2 and E2-6 have very highly degraded buffers, surrounded by pavement on all sides. Other wetlands such as Wetland N1-1 and the southern portion of E1-1a have areas of wider, less disturbed buffers which increase the habitat function of those wetlands.

3.4.4.2 Comparative Evaluation of Wetland Functions

A qualitative summary of each wetland's functional level (high, moderate, or low) is presented in Table 3.4-4 based on the supplemental guidance provided by Ecology (2008). Conversion of the numerical scores in Table 3.4-3 to qualitative groupings of functional level (Table 3.4-4) is necessary if the Ecology rating system is to be used to characterize the potential for a change in function (Washington State Department of Ecology 2008), such as could occur with construction and operation of the proposed project at the build alternative sites (Chapter 4.3). These qualitative groupings can also then be used to assess the sufficiency of any proposed compensatory mitigation and to assess related trade-offs in potential improvement in functional potential to improve water quality, hydrologic functions, and habitat as a consequence of proposed compensatory mitigation (Chapter 5.1.3).

Table 3.4-4. Qualitative Summary of Wetland Functions Based on Numerical Scores from *Washington State Wetland Rating System* (Hruby 2006)

Qualitative Grouping of Wetland Function	POTENTIAL for Improving Water Quality[1]	POTENTIAL for Providing Hydrologic Functions[2]	POTENTIAL to provide Habitat[3]	OPPORTUNITY to provide Habitat[4]
High	12–16+	12–16+	15–18	14–18
Moderate	6–11	6–11	7–14	6–13
Low	0–5	0–5	0–6	0–5

HGM = hydrogeomorphic classification

[1] Total for Question D1or R1 on the rating form depending on HGM Class

[2] Total for Question D3 or R3 on the rating form depending on HGM Class

[3] Total for H1 on the rating form

[4] Total for H2 on the rating form

Source: Ecology (2008); since more than 16 points are possible for the water quality and hydrologic function scores, a plus (+) was added to water quality and hydrologic function potential for the 'high' grouping.

Nearly all of the wetlands have high "potential" to improve water quality because they either have no outlet (thus trapping pollutants) or they have intermittently flowing, highly constricted outlets (e.g., culverts) which constrict some flow and trap water and pollutants in the wetlands. Wetland E3-2 is the exception, being essentially a riverine wetland (albeit very small, narrow, and urbanized). As such it does not trap and hold water to the extent that depressional wetlands do and thus cannot inherently provide a high level of water quality improvement function.

Most of the wetlands have a moderate or high "potential" to provide hydrologic functions, such as flood flow reduction and limiting erosion because of their either intermittently flowing, highly constricted outlet or their lack of an outlet. The exceptions to this are Wetlands E2-5and E3-1 which are small wetlands relative to the size of their basins and which appear to pond less than 6 inches of water. These factors reduce their hydrologic function scores.

The 18 wetlands generally have a low "potential" to provide habitat functions based on the number and interspersion of vegetation classes, the prevalence of special habitat features such as downed logs and snags, and number of native plant species they support (Table 3,4-4). Wetlands N1-1, E1-1a, and E3-5 have the highest habitat potential due to their size, multiple vegetation classes, and prevalence of snags and downed logs. Opportunity to provide habitat functions is limited for all the wetlands to varying degrees by their developed basins, degraded buffers, and limited connections to other wetlands and areas of good habitat. Wetlands N1-1and E1-1a, well as E3-1, E3-4, and E3-5 have moderate habitat opportunity primarily due to have larger portions of their buffers densely vegetated and farther away from areas of regular human disturbance.

For purposes of this assessment, Category 1 or 2 wetlands were considered to be 'high' quality wetlands, in that they would have moderate to high wetland function scores. Only wetland N1-1, the Scriber Creek wetland in the Lynnwood Alternative site, is considered a high quality wetland due to its functional scores. Its Category 2 rating is due to its water quality improvement and hydrologic functions, its proximity and habitat linkages with Scriber Creek, its multiple and interspersed vegetation classes, dominance of native plant species, special habitat features such as snags and downed logs, and its location in the landscape relative to other wetlands and Puget Sound.

Chapter 4
Environmental Consequences

This section describes the expected temporary construction and permanent operational impacts of the proposed project on the following resources:

- Aquatic resources (Section 4.1)
- Vegetation, wildlife habitat, and wildlife resources, including Washington PHS, threatened and endangered species, and species of concern (Section 4.2)
- Wetland resources (Section 4.3)

4.1 Aquatic Resources

This chapter describes the potential impacts of the construction and operation of the proposed project on aquatic species and habitat. The discussion of project impacts assumes that the BMPs described in Appendix A would avoid and minimize most impacts during construction. Sound Transit considered the following potential impacts on aquatic resources:

- Direct fish mortality
- Permanent loss of in-stream physical habitat
- Permanent degradation of in-stream physical habitat, such as shading, chronic sedimentation, removal of boulders or LWD from the channel, and loss of riparian vegetation function (loss of nutrient inputs, LWD recruitment, and shade)
- Temporary loss of in-stream physical habitat (dewatering)
- Temporary degradation of habitat (e.g., sedimentation, removal of riparian vegetation, disturbance to stream banks)
- Altered hydrology (e.g., higher peak flows causing increased scour/deposition downstream; decreased percolation from impervious surfaces causing lower base flows)
- Temporary or permanent degradation of water quality (e.g., increased temperature, increased turbidity, increased loading of heavy metals and hydrocarbons)
- Increased artificial lighting
- Impacts on fish passage at culverts and new culverts
- Facilitation of urban development
- Beneficial impacts associated with in-stream and riparian restoration, and daylighting existing culverts

Construction of the proposed project could affect aquatic species and habitat near the build alternative sites. This section addresses the potential direct effects of construction and operation activities of each build alternative. Within this context, construction activities typically have short-term effects, which cease or begin to abate, after specific construction activities end. In contrast,

operational activities tend to have long-term or recurring effects. In addition to these potential direct effects, the proposed project can also have indirect effects, which include changes in land use (i.e., increased development or rate of development), that can also affect aquatic species and habitat over the long-term.

This analysis centers on the potential for project impacts on adjacent and downstream aquatic and riparian habitat including potentially affecting treaty protected fisheries resources. This includes direct disturbance or alteration of these habitat features, as well as indirect effects related to project operations. While these impacts can affect a number of aquatic species, there is little or no information regarding the actual presence or conditions of these resources in the project area. Therefore, the primary focus of the assessment is on the impacts that are known to affect the ability of the aquatic environment to support fish, and other aquatic life based on the proximity of their known or expected distribution, or the occurrence of suitable habitat in the project vicinity. In addition, the analyses focus primarily on native fish species and habitat, because of the available information regarding their occurrence in, or potential use, of the water bodies in the study area. They also include most of the threatened, endangered or species of concern that occur in the project area waters, and are economically important in the overall region. The various salmonids are generally addressed as a single group, because the habitat requirements and types of potential impacts are similar, although species-specific impacts are identified where appropriate. Potential effects on other (nonfish) aquatic species (e.g., amphibians) are addressed in the wildlife sections (Section 4.2 Vegetation and Wildlife).

Discussions of long-term and construction-related impacts include assessing the range of impacts that could occur for each build alternative. Actual impacts would depend on final alternative selection and design, construction footprint and methods, BMPs implemented during construction, and performance of post-construction restoration actions, as applicable. This includes revegetation of disturbed areas and mitigation measures required by federal, state, and local regulations, including local Critical Areas Ordinances.

During the Final EIS process, Sound Transit will also review the proposed project to ensure compliance with the ESA and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). However, Sound Transit expects that the proposed project would not have any adverse effects on the species or habitat protected by these acts, based on the known distribution of these species. Section 7(a) (2) of the ESA stipulates that federal agencies must consult with the NMFS and the USFWS to ensure any action authorized, funded, or carried out by a federal agency (in this case, the Federal Transit Administration, which is providing project funding) is not likely to jeopardize the continued existence of any endangered or threatened species, or result in the adverse modification or destruction of designated critical habitat.

Similarly, the Magnuson-Stevens Act requires federal agencies to consult with the NMFS to ensure that their actions minimize, to the extent practicable, adverse effects on essential fish habitat for federally managed fisheries. Essential fish habitat is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The essential fish habitat potentially affected by the proposed project would be habitat for Chinook and coho salmon.

4.1.1 Temporary Construction-Related Impacts

4.1.1.1 Impacts Common to All Build Alternatives

Construction-related impacts would occur where the project limits cross streams or encroach into stream buffers. Construction impacts would be temporary, and limited to the period during and immediately following project construction. Construction effects at the BNSF Storage Tracks component of the Lynnwood Alternative, BNSF Alternative, and BNSF Modified Alternative sites in Bellevue would be limited to tributary wetlands upstream of the defined channel network of the West Tributary of Kelsey Creek. Construction at the SR 520 Alternative site would directly affect Goff Creek, essentially eliminating the existing surface features and directing the channel into pipes. The Lynnwood Alternative site would directly affect the floodplain of Scriber Creek and its associated wetland (Wetland N1-1), as construction involves clearing and filling the western edge of the floodplain/wetland and the placement of track footings in the floodplain/wetland near where the defined channel of Scriber Creek loses definition and spreads out into the wetland.

Although work within the OHWM would be limited, any construction conducted at the sites has the potential to deliver sediment and contaminants (e.g., fuel and hydraulic fluids) to streams downstream of the proposed project, which could adversely affect aquatic species and habitat conditions, and therefore, could potentially affect treaty-protected fisheries resources. Excessive sediment might preclude downstream salmonid spawning, reduce egg survival, and/or decrease the production and diversity of benthic invertebrates, which provide important food sources of juvenile salmon and resident fish. Increased sedimentation can also reduce the overall quality and quantity of downstream rearing habitat, including habitat supporting juvenile salmonids. Such effects would include direct effects on fish from clogging of gill tissues, behavioral alteration, and/or reduced foraging success. While turbidity typically occurs over a relatively short period of time, the effects of the turbidity on downstream substrate conditions (e.g., sedimentation) can persist for a longer period of time after the source of the turbidity is corrected.

The risk of impact from sedimentation increases during construction because construction activities create exposed soils, subject to erosion and transport to nearby streams (and wetlands). Stormwater discharge during construction would require a National Pollutant Discharge Elimination System (NPDES) permit, issued by Ecology under the federal Clean Water Act (CWA) authorization, to protect water quality conditions. The goal of the permit is to reduce or eliminate stormwater pollution and other impacts on surface waters from construction sites. Temporary erosion and sediment control (TESC) plan BMPs would be implemented and maintained in accordance with a stormwater pollution prevention plan (SWPPP) that would be prepared, as required by the NPDES permit. The TESC plan would include silt fences; protective ground covers such as straw, plastic sheeting, or jute mats; and straw bales in drainage features. Erosion control measures include minimizing areas of grading and vegetation removal, restricting clearing and grading during the rainy season, and requiring immediate revegetation following construction.

The SWPPP would identify BMP plans to control and maintain erosion and soils to avoid or minimize the delivery of construction-related sediment to streams (Appendix A). Where appropriate, the SWPPP would also include a Concrete Containment and Disposal Plan, Dewatering Plan, and a Fugitive Dust Plan. Permits issued by the cities of Bellevue and Lynnwood, and other jurisdictional agencies (e.g., the Corps, Ecology, and WDFW) would also contain detailed conditions of development and requirements for protecting critical areas and habitats. Examples of these

strategies include minimizing vegetation clearing, restoring temporarily affected areas, and preparing and implementing a revegetation plan.

These measures are particularly important when development and clearing activities occur near streams, lakes and wetlands. BMPs would also be implemented to limit soil compaction in sensitive areas, and temporary work bridges could be used in extremely sensitive areas, such as the Scriber Creek wetland (Wetland N1-1).

Although the implementation of erosion control and other stormwater BMPs would minimize or eliminate sediment loading to area streams during construction, some sediment might still be discharged to streams, due to limitations in BMP effectiveness or failure during extreme conditions. Sediment discharges would increase turbidity levels, which can adversely affect fish by disrupting feeding and territorial behavior, increasing stress levels, increasing gill damage, and reducing overall survival.

In addition to the potential effects erosion and sediment loading, the use of heavy construction equipment could increase the potential for leakage of fuel, oil, or hydraulic fluids. A spill prevention, control, and countermeasures plan would also be developed and implemented, as part of the SWPPP, to avoid or minimize construction-related pollutants from entering streams. However, there is still a possibility that some pollutants could be carried by stormwater to area streams. Construction adjacent to or within streams, wetlands, or their buffers would have the highest risk of delivering sediment and pollutants to downstream waters.

For this reason, the total amount of ground disturbance, and the amount of stream or wetland buffer permanently affected, provides an indicator of the risk of potential temporary construction-related impacts (Table 4.1-1).

4.1.1.2 Specific Temporary Construction Impacts of Alternatives

Construction of the proposed project could have temporary construction impacts on aquatic resources. However, the amount of area that would be affected by project construction under the alternatives cannot be determined because construction limits have not been defined in all parts of the study area at the level of design used for the Draft EIS analysis.

The analysis of potential construction impacts did not identify any areas where temporary impacts could extend beyond the study area defined for the analysis of operational impacts. For the ecosystems analysis, all temporary impacts were assumed to occur within the defined project limits and it is assumed that the level of temporary construction impacts would be commensurate with the level of long-term impacts for each build alternative (Table 4.1-1).

The following sections outline the range of potential temporary construction impacts that could occur for each alternative. Actual impacts would depend on the final alternative selection and design, construction footprint and methods, BMPs implemented during construction, and performance of post-construction restoration. Direct construction impacts will be identified and quantified during the Final EIS and permitting phases.

Lynnwood Alternative

Construction activities at the Lynnwood Alternative site are expected to include construction within the adjacent Scriber Creek wetland, which may affect the 100-year floodplain of Scriber Creek, potentially resulting in the temporary loss of riparian habitat due to impacts on wetland vegetation

(Figure 4.1-1a). Temporary work bridges would be used, where appropriate, to minimize effects on the wetland during construction. It is expected that the implementation of appropriate BMPs, as described above and in Appendix A, would prevent temporary impacts on Scriber Creek and associated aquatic resources during construction activities at the Lynnwood Alternative site and that any indirect impacts on the wetland and floodplain would be effectively minimized or mitigated.

Additional discussion of temporary construction impacts on the Scriber Creek wetland is provided in Section 4.3.1.2. Additional discussion of temporary construction impacts on the 100-year floodplain of Scriber Creek is presented in Chapter 3-10, Water Resources, of the Draft EIS.

Design Option C1

The potential effects of Design Option C1 would be the same as those described above for the Lynnwood Alternative site. No temporary construction impacts would occur to the stream channel (Figure 4.1-1a). Therefore, no measurable effects on the aquatic resources are likely to occur.

Design Option C2

The potential effects of Design Option C2 would be similar to those described above for the Lynnwood Alternative site, except that this option would also include the placement of guideway support footings within the Scriber Creek wetland (i.e., Wetland N1-1), which forms a portion of the creek's 100-year floodplain (Figure 4.1-1a), potentially resulting in temporary impacts on the stream's floodplain and the Scriber Creek wetland). Temporary work bridges would be used, where appropriate, to minimize effects on this wetland complex during construction of these footings or support columns. As described above, some of these structures would occur within the 100-year floodplain of Scriber Creek, but would not occur below the OHWM of the stream. Therefore, no measurable direct effects on the aquatic resources are likely to occur.

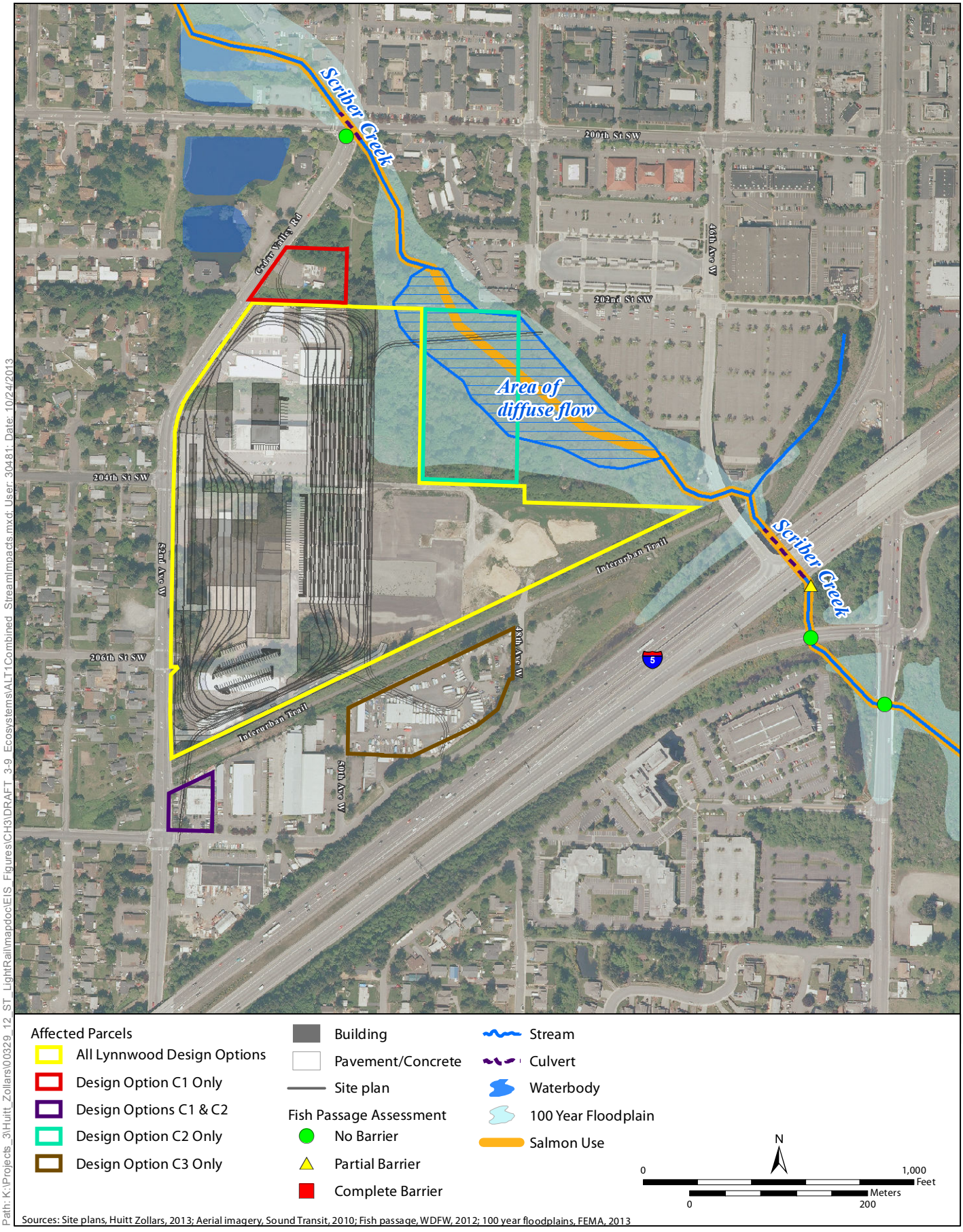

Figure 4.1-1a: Lynnwood Alternative—Streams and Fish Passage Impacts
Ecosystems Technical Report

Design Option C3

The potential effects of Design Option C3 would be the same as those described above for the Lynnwood Alternative site (Figure 4.1-1a. Therefore, no measurable temporary effects on the aquatic resources are likely to occur.

BNSF Storage Tracks

The BNSF Storage Tracks component of the Lynnwood Alternative would be located in Bellevue along a portion of the BNSF tracks that is also encompassed within the BNSF Alternative and BNSF Modified Alternative sites. The implementation of appropriate BMPs is expected to avoid temporary impacts of construction activities on aquatic resources in the vicinity. No construction activities would occur below the OHWM of any stream under this alternative (Figure 4.1-1b) and no construction impacts would occur on the functional stream buffer or floodplain of the West Tributary of Kelsey Creek as it emanates and flows through Wetland E2-4.

BNSF Alternative

The potential construction effects of this alternative would be similar to those described above in Section 4.1.1.1. The implementation of appropriate BMPs is expected to avoid effects of construction activities on aquatic resources in the vicinity. No construction activities would occur below the OHWM of any stream under this alternative and no disturbance of the functional stream buffer or floodplain of the West Tributary of Kelsey Creek would occur (Figure 4.1-2).

BNSF Modified Alternative

The potential construction effects of this alternative would be similar to those discussed above for the BNSF Alternative. Therefore, no measurable effects on the aquatic resources are likely to occur (Figure 4.1-3).

SR 520 Alternative

The potential construction effects of this alternative would be similar to those described above in Section 4.1.1.1. The implementation of appropriate BMPs is expected to avoid effects of construction activities on downstream aquatic resources.

However, this alternative would include substantial modification of Goff Creek within the project site boundaries (Figure 4.1-4). As described above in Section 3.2.2, this stream segment is currently highly modified and confined within a man-made channel extending throughout the project site, with no natural riparian habitat. This alternative would require relocating this stream channel, or placing it in pipes through the project site (these permanent operational impacts are addressed in Section 4.1.2).

Figure 4.1-1b: Lynnwood Alternative, BNSF Storage Tracks*—Streams and Fish Passage Impacts
Ecosystems Technical Report
*The BNSF Storage Tracks are located in Bellevue

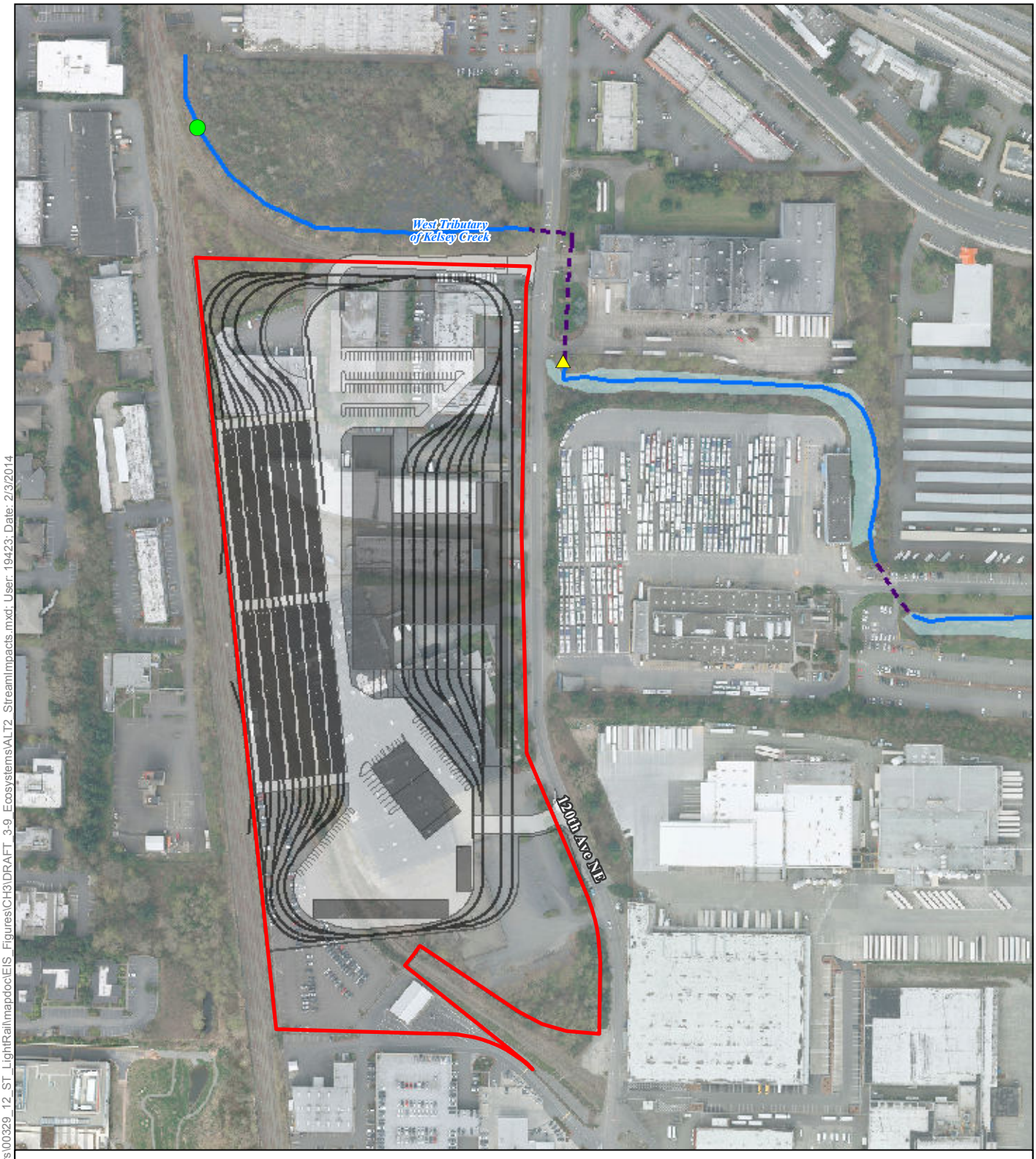

Figure 4.1-2: BNSF Alternative—Streams and Fish Passage Impacts
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Figure 4.1-3: BNSF Modified Alternative—Streams and Fish Passage Impacts
Ecosystems Technical Report

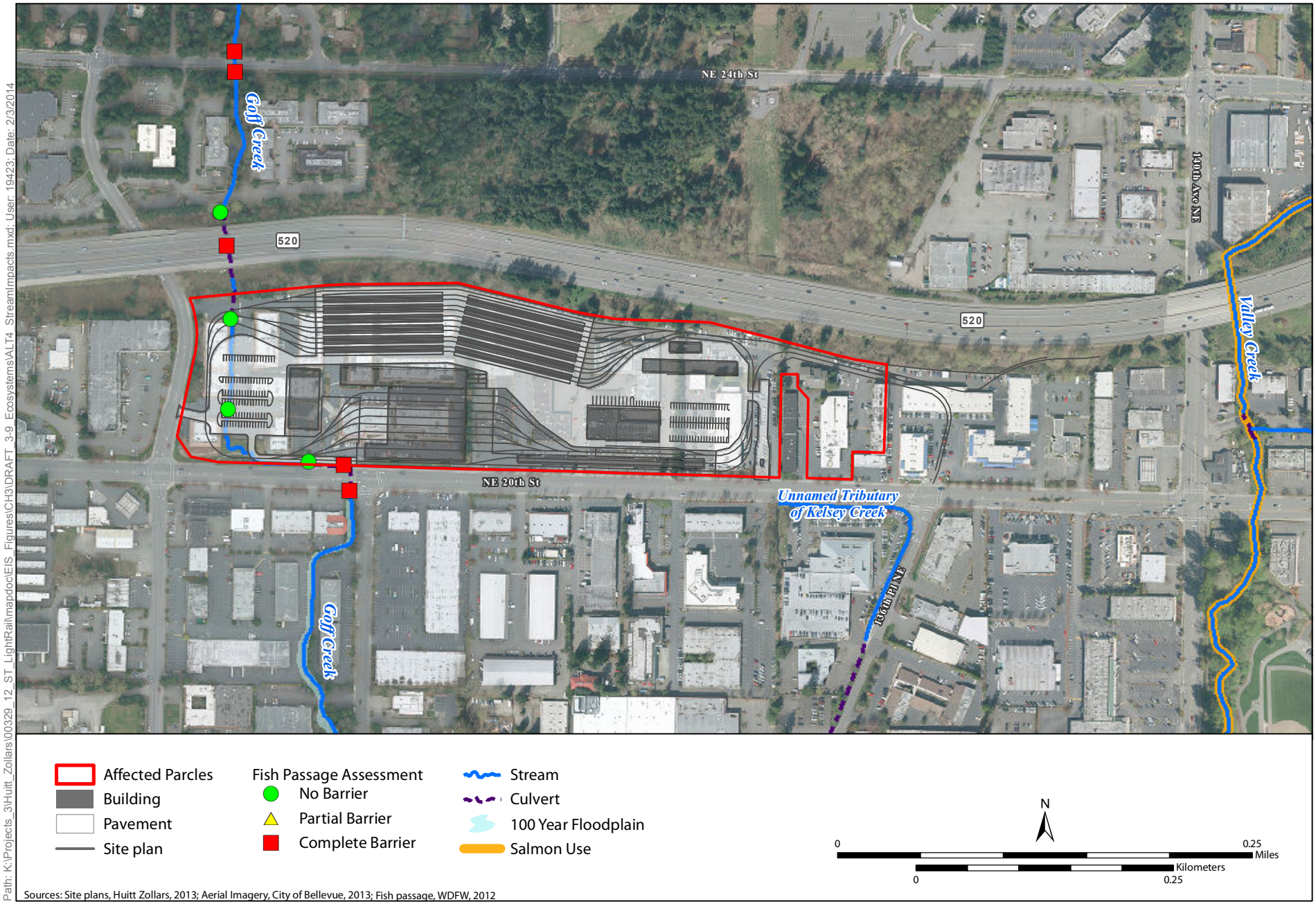

Figure 4.1-4: SR 520 Alternative—Streams and Fish Passage Impacts
Ecosystems Technical Report

Construction activities would be conducted outside of the stream OHWM, until the relocated stream channels or pipes are completed. The streamflows would then be diverted into the new conveyance structures, and the existing channel filled. This process is expected to avoid or substantially minimize potential temporary degradation of downstream water quality conditions during the construction phase.

Before the flow is diverted to the new conveyance structures, and the existing channel dewatered, fish removal activities would be conducted. While these channels are not expected to support extensive fish use, some resident fish are likely to occur, and would need to be removed before stream dewatering or extensive in-water work. These activities would be conducted in compliance with WDFW requirements identified in the project HPA permit.

4.1.2 Permanent Operational Impacts

4.1.2.1 Impacts Common to All Build Alternatives

Permanent impacts could occur where the project limits encroach on stream channels, stream buffers, or stream floodplains, or where the proposed project would pipe a currently open stream channel (e.g., the portion of Goff Creek in the SR 520 Alternative site). The project limits would include the operation and OMSF footprint (including parking), roadway improvements, changes to storm drainage, and other ancillary features. As per the operational impact assumptions (Section 1.4.1.2), nearly all construction is anticipated to occur outside of the OHWM of streams. No impacts on anadromous fish passage are anticipated to currently accessible stream channels because no new culverts, or culvert extensions would be added in stream reaches currently accessible by anadromous fish. Impacts on anadromous fish associated with piping the currently open channel of Goff Creek were considered in light of the potential preclusion of fish use if downstream barriers are removed in the future. The potential for such construction to adversely affect aquatic species or habitats would be avoided or minimized through the implementation of conservation measures necessary for permit compliance.

Permanent impacts on the floodplain and on stream buffer habitat may occur, where elevated guideways are placed in the floodplain or span areas of buffer vegetation, or where fill encroaches on a stream or stream buffer. While fill would generally eliminate vegetation, construction of elevated guideways could also indirectly affect vegetation by reducing the amount of direct precipitation and sunlight reaching the vegetation below the guideways. In particular, guideways with low clearance (i.e., less than about 15 feet) may restrict or eliminate vegetation growth under the structure (Federal Transit Administration 2011). The elevated guideway structures entering and exiting the maintenance facility sites would be relatively narrow, ranging from a maximum of approximately 33 feet wide for the double cross over guideways at the Lynnwood Alternative site [Option C3] to a maximum of approximately 17.75 feet for single track guideways at the BNSF Modified Alternative site. The structures would allow gradual elevation changes between the ground elevation at the OMSF and the height of the elevated mainline guideway. As a result, the effects would vary by structure height, although the overall effects on riparian vegetation would typically be limited.

Based on the nature, location, and condition of the majority of existing stream buffers, the proposed alternatives would not result in significant degradation of existing stream buffer habitat conditions. The Lynnwood Alternative site is an exception, as the development of this site would result in the

loss of wetland vegetation that forms the stream buffer along Scriber Creek and provides beneficial riparian habitat functions to the aquatic system.

The development of each alternative would generally result in an increase in the amount of impervious surface at each site. New impervious surfaces would include maintenance buildings, parking areas, new tracks and guideways, train storage areas and roadways. These new surfaces would replace a mix of existing impervious and pervious surfaces at each site. Impervious surfaces are associated with negative effects on surface waters, including both hydrologic and water quality impacts. Modern stormwater detention and treatment standards are designed to avoid and minimize these impacts on the greatest extent practicable. The Washington Department of Ecology sets the standard for stormwater treatment methods applicable in this region in the 2012 *Stormwater Management Manual for Western Washington* (Washington State Department of Ecology 2012). Sound Transit's *Design Criteria Manual* (Sound Transit 2012) requires that all new facility designs include stormwater detention and treatment infrastructure consistent with or exceeding local and state requirements. Each of the Alternatives would therefore incorporate stormwater detention and treatment consistent with these current standards. These standards include providing stormwater detention consistent with pre-development forested baseline conditions and the best treatment technologies applicable given site-specific conditions (Washington State Department of Ecology 2012).

It is important to note that each alternative site has existing pollution-generating impervious surfaces (PGIS), primarily parking lots and access roads that were developed before modern stormwater management requirements were in place. These sites currently provide little or no stormwater detention and treatment. Therefore, each alternative would replace at least some area of existing untreated PGIS with fully detained and treated PGIS. Moreover, the majority of new impervious surface associated with each alternative would be track yarding. Track yarding is not considered PGIS for the purpose of stormwater treatment. This means that the existing untreated PGIS would be replaced by a smaller amount of fully treated PGIS, and the total amount of stormwater pollutants produced at each site would likely decline relative to existing conditions. The water resources impact analysis is presented in Chapter 3-10, Water Resources, of the Draft EIS.

Given these factors and Sound Transit's commitment to design the proposed project to meet the stormwater management requirements of each jurisdiction, the build alternatives are not expected to have direct adverse effects on water quality. As a result, peak streamflows would not increase because the stormwater systems built for the proposed project would be designed to simulate pre-development hydrology. Additional measures to reduce stormwater runoff, such as low-impact development or other on-site measures, would be considered at a more advanced phase of project development. As a result, stormwater from all project-related impervious surface area would receive appropriate flow control, so that peak streamflows would not be increased. Development of the Lynnwood Alternative site is expected to have indirect adverse effects on water quality because of the loss of 2 acres of stream-associated wetlands that provide beneficial flow retention and vegetative filtering functions for Scriber Creek. These effects are described in more detail below.

To the extent that impacts cannot be avoided or minimized through BMPs, Sound Transit would implement additional measures to reduce adverse effects and provide compensatory mitigation measures where adverse effects are unavoidable. Sound Transit has committed to achieving no net loss of ecosystem function on a project-wide basis. Compensatory mitigation would be conducted in accordance with applicable federal, state, and local requirements and guidelines. These include the federal *Final Compensatory Mitigation Rule* (40 CFR Part 230); interagency guidance prepared by

Ecology, the U.S. Army Corps of Engineers, and U.S. Environmental Protection Agency in *Wetland Mitigation in Washington State* (Washington State Department of Ecology et al. 2006a and 2006b); and local Critical Areas Ordinances.

4.1.2.2 Specific Operational Impacts of Alternatives

The proposed project could have permanent operational impacts on aquatic resources in the project vicinity. These include mostly direct and some potential indirect impacts. The following sections outline the range of potential impacts that could occur for each alternative. Actual impacts would depend on the final alternative selection and design, construction footprint and methods, BMPs implemented during construction, and performance of post-construction restoration.

The potential permanent operational impacts by alternative are summarized in Table 4.1-1 and Figures 4.1-1 through 4.1-4 and described in detail below.

Table 4.1-1. Potential Permanent Operational Impacts on Aquatic Resources

Alternative	Aquatic Resource	Direct Stream Impacts (linear feet)	Stream Buffer Impacts (acres)	Impacts within 100-Year Floodplain (acres)
Lynnwood Alternative				
Design Option C1	Scriber Creek	0	<0.1	<0.1
Design Option C2	Scriber Creek	0	0.1	0.1
Design Option C3	Scriber Creek	0	0	<0.1
BNSF Storage Tracks	West Tributary of Kelsey Creek	0	0	0
BNSF Alternative	West Tributary of Kelsey Creek	0	0	0
BNSF Modified Alternative	West Tributary of Kelsey Creek	0	0	0
SR 520 Alternative	Goff Creek	700	0.64	0

Lynnwood Alternative

Construction of the Lynnwood Alternative would occur within the 100-year floodplain of Scriber Creek and would vary by design option. Permanent impacts would include the placement of approximately 1,000 cubic yards of fill in the Scriber Creek floodplain (under Design Options C1 and C3) or the placement of approximately 1,100 cubic yards of fill in the floodplain under Design Option C2 (due to track footings being placed in the floodplain/Scriber Creek wetland). Impacts associated with the placement of fill in the Scriber Creek floodplain are detailed in Section 3.10, Water Resources, of the Draft EIS.

This alternative is not expected to measurably affect fish species or aquatic habitat conditions in Scriber Creek, or in downstream reaches, because of the limited extent and location of potential effects. No direct impacts on the Scriber Creek stream channel would occur, and any indirect impacts on aquatic resources through impacts on the wetland and floodplain would be effectively minimized or mitigated. The Lynnwood Alternative would directly affect 1.9 to 2.1 acres of the

Scriber Creek wetland (Wetland N1-1), which forms a portion of the 100-year floodplain of Scriber Creek (Table 4.3-2). However, the affected area represents an insignificant portion of the overall Scriber Creek subbasin, and the affected area is effectively isolated from the southeastern portion of the wetland where the stream channel reforms by dense forested and scrub-shrub wetland vegetation.

In addition, the stormwater treatment and flow control measures provided under all the design options, are expected to result in no measurable impacts on flow or water quality conditions in Scriber Creek (Appendix A). Additional discussion of permanent impacts on the 100-year floodplain of Scriber Creek is presented in Section 3.10, Water Resources, of the Draft EIS.

Design Option C1

The potential effects of Design Option C1 would be similar to those described above for the Lynnwood Alternative site. The lead tracks for Design Option C1 follow currently developed routes along the edges of the wetland. This design option would place approximately 1,000 cubic yards of fill into the western edge of the creek's 100-year floodplain, and would thus affect approximately 1.9 acres of the Scriber Creek wetland. The C1 Option is not expected to result in a permanent impact on fish species or aquatic habitat in Scriber Creek because the footprint of this option represents an insignificant portion of the overall subbasin, and no direct impacts on stream channel habitat would occur (Figure 4.1-1a).

Design Option C2

The potential effects of Design Option C2 would be similar to those described above for the Lynnwood Alternative site, but with a slightly higher volume of fill in the 100-year floodplain due to the placement of the track footings and, thus, a slightly larger area of impact on the Scriber Creek wetland. Under Design Option C2, the lead track running east from the site would be constructed near the middle of the wetland and thus near the diffuse flow of Scriber Creek as it passes through the center of the wetland. Design Option C2 would result in 0.2 acre more wetland impact than Design Option C1 or C3 (2.1 acres versus 1.9 acres) because of the configuration of the track extending through the wetland to join track from the Lynnwood Link Extension project (Table 4.3-2 for wetland impacts) (Figure 4.1-1a). No additional effects are expected on fish species or aquatic habitat conditions because the footprint of this option represents an insignificant portion of the overall subbasin, and no direct impacts on the stream channel would occur.

Design Option C3

The potential effects of Design Option C3 would be similar to those described above for the Lynnwood Alternative site and Design Option C1. Design Option C3 is expected to result in less wetland habitat loss than Design Option C2 and the same impacts as Design Option C1 (Table 4.3-2 for wetland impacts) (Figure 4.1-1a). No additional effects are expected on fish species or aquatic habitat conditions because the footprint of this option represents an insignificant portion of the overall subbasin, and no direct impacts on the stream channel would occur.

BNSF Storage Tracks

No streams or stream buffers would be affected by this component of the Lynnwood Alternative. Operation of this alternative would also affect approximately 63 linear feet (less than 0.01 acre) of ditches.

Permanent operational impacts of the BNSF Storage Tracks component of this alternative would include fill of several of the wetlands along the eastern side of the existing BNSF tracks (Eastside Rail Corridor), including along the base of the western slope and the western side of the tracks (Figure 4.1-1b). This would result in the permanent loss of wetlands and wetland buffers (as described below).

It is expected that the implementation of appropriate BMPs would avoid or minimize impacts during construction, such as turbidity, on any portions of the wetlands that are not permanently affected by the project footprint.

BNSF Alternative

The potential effects of this alternative would be similar to those described above, in Section 4.1.2.1-Impacts Common to All Build Alternatives. The permanent effects of this alternative on aquatic habitat would likely be very limited, with no direct stream channel or stream buffer impacts (Figure 4.1-2). Construction of the proposed project at this site would result in a 3% increase in the impervious area of the site from 20.8 acres to 21.4 acres. The proportion of the site characterized as pollution generating impervious surface (PGIS) would decrease by 21% from 11.1 to 8.8 acres due primarily to the conversion of parking lots to track yarding (Section 3.10, Water Resources of the Draft EIS). In addition, retrofitting the stormwater treatment and control measures on the site, to meet current regulations is expected to result in measurable improvements in downstream water quality and streamflow characteristics compared to existing conditions.

BNSF Modified Alternative

The potential construction effects of this alternative on aquatic resources would be similar to those discussed above for the BNSF Alternative. The BNSF Modified Alternative would result in a 12% increase in the impervious area of the site from 23.8 acres to 26.7 acres and the proportion of the site characterized as PGIS would decrease by 9% from 13.6 acres to 12.4 acres due primarily to the conversion of parking lots to track yarding (see Section 3.10, Water Resources of the Draft EIS). No construction activities would occur below the OHWM of any stream or within the stream buffer under this alternative, and retrofitting the stormwater treatment and control measures would improve downstream water quality and streamflow characteristics compared to existing conditions.

SR 520 Alternative

The SR 520 Alternative would alter groundwater, surface water, and stormwater drainage from the site in ways that could have both positive and negative effects on aquatic resources. The SR 520 Alternative would route approximately 700 feet of existing open channel of Goff Creek into piped conveyance systems (Figure 4.1.4), and would eliminate approximately 0.64 acre of stream buffer habitat (0.21 acre of which is also wetland buffer as described below). Grading of the site to allow for a level track yard would eliminate the surface channel and increase the vertical drop where Goff Creek emerges from under SR 520. This would permanently preclude the restoration of fish passage to this portion of Goff Creek, and degrade aquatic habitat functions provided by the affected segment of stream channel. The resulting direct effects on fish and other living aquatic resources would be limited because the portion of Goff Creek within the site is fragmented and separated from productive habitat areas elsewhere in the Goff Creek and Kelsey Creek watersheds and provides poor habitat suitability for aquatic species.

Although this section of stream is highly modified and surrounded by commercial development, it could provide some usable aquatic habitat for resident fish species, such as cutthroat trout, although fish use is expected to be limited due to the generally poor stream and riparian habitat conditions and extensive culverts causing fragmented habitat. However, the existing open channel provides other important stream functions, including contributions to groundwater-fed base flows and water temperatures in downstream reaches, and transporting nutrient and organic material downstream to support the base of the aquatic food chain.

Indirect effects on aquatic habitat function could result from alteration of groundwater hydrology on the site. The existing 700 feet of open channel of Goff Creek, as well as the 226 feet of surface features described as Waters of the U.S. #1and #2 (below), appear to route groundwater from the site into Goff Creek and eventually Kelsey Creek, likely providing beneficial baseflow and water temperature conditions in these habitats. The disruption of groundwater inflow could result in detrimental indirect effects on habitat quality, with the extent and severity dependent on how groundwater from the site is collected and routed to surface waters. Any such adverse effects could be effectively minimized through appropriate design and operation of groundwater drainage systems.

In contrast, the SR 520 Alternative would improve water quality conditions by reducing the amount of pollution-generating impervious surface (PGIS) that drains to surface waters, and by increasing stormwater detention and treatment capacity. The SR 520 Alternative would result in a 33% increase in the impervious area of the site from 18.9 acres to 25.1 acres. The proportion of the site characterized as PGIS would decrease by 18% from 13.3 to 10.9 acres due primarily to the conversion of parking lots to track yarding. The SR 520 Alternative would also improve stormwater detention and treatment site-wide relative to current conditions. The existing site was developed prior to the advent of modern stormwater regulations and a large portion of the existing runoff is untreated. The western portion of the site, approximately 14.9 out of 26.4 total acres, provides some level of stormwater detention and treatment via detention vaults, but the level of treatment is not consistent with current standards. The remaining approximately 11.5 acres has no stormwater detention or treatment, meaning that the existing approximately 6.67 acres of PGIS in this portion of the site drains directly to surface waters. The SR 520 Alternative would retrofit the entire 26-acre site with modern stormwater detention and treatment consistent with current regulatory standards. On this basis, the SR 520 Alternative would likely result in an incremental improvement in water quality conditions in downstream receiving waters relative to current conditions.

Due to extensive downstream channel modifications, the 700 feet of open channel within the project site represents a substantial portion (about 36%) of the total length of open channel habitat currently available between SR 520 and currently accessible anadromous fish habitat in Goff Creek downstream of Bel-Red Road. Although anadromous fish do not currently pass upstream of Bel-Red Road because of blocking culverts, access could be restored in the future by modifying these blockages and restoring stream habitat. The City of Bellevue has plans to daylight large sections of Goff Creek (City of Bellevue 2012a) downstream of the SR 520 Alternative site. While streamflows and water quality conditions are expected to be slightly improved, as a result of meeting stormwater design standards, this alternative would result in a net loss of aquatic habitat in Goff Creek. The open channels contribute to groundwater-fed base flows and water temperatures in downstream reaches, and transport nutrients and organic material downstream to support the aquatic food chain. Overall, the loss of the open channel habitat in the SR 520 Alternative site footprint would be considered a significant impact on aquatic resources in Goff Creek by the Washington Department of Fish and Wildlife, requiring mitigation to offset the loss of habitat function.

Project BMPs are expected to prevent any direct or indirect effects on Valley Creek, which occurs about 150 feet east of the SR 520 Alternative site.

4.2 Vegetation and Wildlife

Sound Transit considered potential impacts on vegetation and wildlife from each build alternative. Impacts include both long-term, operational impacts, and short-term, construction-related impacts. For wildlife, the analysis was based largely on examining the amount and quality of habitat that is currently available for use by wildlife, and comparing it with the amount and quality of habitat that would be available after project construction. Quality of habitat is defined by the amount, distribution, and type of vegetation present; it is also defined by the amount of noise and other human disturbances that occur within or adjacent to the habitat. Other factors, such as wetland hydrology and water quality, can also influence the quality of habitat. For example, certain amphibian species are sensitive to increases in wetland water level fluctuations that may result from development (Richter and Azous 1995).

4.2.1 Temporary Construction-Related Impacts

4.2.1.1 Impacts Common to All Build Alternatives

Noise and Human Disturbance

Both noise and human activity have been demonstrated to displace wildlife from occupied habitats. Noise can interfere with: birds' abilities to hear territorial songs, mating and alarm calls in amphibians and ground squirrels, and mammal and raptor foraging activities (Schaub et al. 2008). There are numerous studies documenting wildlife avoidance of roads and facilities and wildlife disturbance from human activity at varying distances (Madsen 1985, Van der Zande et al. 1980, Fyfe and Olendorff 1976, and Bortolotti et al. 1985).

All of the build alternatives are in urban environments where wildlife have already habituated to a certain level of human noise and activity from highways, residential areas, commercial development, and transit corridors. The degree to which the proposed project may increase or decrease noise and disturbance levels to wildlife is described by alternative in Section 4.2.1.2 Impacts by Alternative.

ESA-Listed Species and State Priority Species and Habitats

No state or federal threatened or endangered wildlife or plant species would be affected by any of the alternatives because they are not present in the area or habitats associated with the alternative sites. Any of the candidate species, species of concern, sensitive species, or monitor species listed in Table 3.3-2 could be affected during construction through small losses of habitat and noise disturbance if these species are present in the study area. The only documented occurrence of a priority species at any of the alternative sites is the pileated woodpecker in association with the Lynnwood Alternative site and the BNSF Storage Tracks component of the alternative in Bellevue. Potential impacts on this species are discussed in Section 4.2.1.2, Specific Temporary Construction Impacts of the Alternatives. Construction noise could temporarily displace pileated woodpeckers transiting over the BNSF Alternative and BNSF Modified Alternative sites to forage in Wetlands E2-3 or E2-4 as described below.

Noxious Weeds

Noxious weeds and exotic plants rapidly colonize disturbed sites such as construction areas. They prevent native species from becoming re-established following ground disturbance, spread into undisturbed areas, and provide poor wildlife habitat or forage. Several of the BMPs that would be implemented during project construction are intended to avoid, reduce, and control new infestations of noxious weeds. These are listed in Appendix A. Given the widespread occurrence of Himalayan blackberry (*Rubus armeniacus*) in the project area under current conditions, all of the Build Alternatives provide opportunity to reduce noxious weeds through vegetation removal and replanting of native species.

4.2.1.2 Specific Temporary Construction Impacts of the Alternatives

Construction of the proposed project could have temporary construction impacts on vegetation and wildlife habitat in the project vicinity. However, the amount of area that would be affected by project construction under the alternatives cannot be determined because construction limits have not been defined in all parts of the study area at the level of design used for the Draft EIS analysis.

The analysis of potential construction impacts did not identify any areas where temporary impacts could extend beyond the study area defined for the analysis of operational impacts. For the ecosystems analysis, all temporary impacts were assumed to occur within the defined project limits and it is assumed that the level of temporary construction impacts would be commensurate with the level of long-term impacts for each build alternative.

The following sections outline the range of potential temporary construction impacts that could occur for each alternative. Actual impacts would depend on the final alternative selection and design, construction footprint and methods, BMPs implemented during construction, and performance of post-construction restoration. Direct construction impacts will be identified during the Final EIS and permitting phases.

Lynnwood Alternative

A certain amount of vegetation would be disturbed or destroyed outside of the project footprint for the purpose of construction. Most of these areas would be re-vegetated with native vegetation following construction. The short-term effect would be displacement or loss of wildlife due to habitat loss. After construction, the replanted areas would provide native vegetation for wildlife, although it would be decades before the habitat would provide mature forested canopy cover. This temporary loss of habitat would have a negative impact on wildlife. A potential benefit to wildlife would be the removal of noxious weeds and replanting with native vegetation.

Project construction would increase noise levels and human activity temporarily, which could cause temporary displacement of some of the species using habitat in the vicinity of the noise, including temporary displacement of pileated woodpeckers foraging on snags in the wetland. These species would be expected to return after construction. Lynnwood Alternative Option C2 would have a greater impact on wildlife than Option C1 or Option C3. Under Option C2, the lead track running east from the site would be constructed near the middle of Wetland N1-1. Lead tracks for Option C1 and Option C3 follow currently developed routes along the edges of the wetland. Thus construction of Option C2 has a greater potential to bring noise and disturbance through the middle of the wetland, affecting interior habitats and temporarily displacing wildlife species to the edges of the wetland or other areas of adjacent habitat.

BNSF Alternative

It is expected that little, if any, vegetation would need to be removed from outside the project footprint for construction purposes. Project construction would increase noise levels and human activity temporarily, which could cause temporary displacement of wildlife using habitat in the vicinity of the noise. This would be most likely to occur related to the forested habitat provided by Wetland E2-4 to the north of the site. Construction noise could temporarily displace pileated woodpeckers transiting over the site to forage in Wetlands E2-3 or E2-4. Wildlife species would be expected to return after construction.

BNSF Modified Alternative

Short-term vegetation disturbance outside the project footprint is expected to be minimal to none. Whatever vegetation is disturbed would be replanted, with an opportunity to increase native vegetation cover and decrease invasive species cover. Project construction would increase noise levels and human activity temporarily, which could cause temporary displacement of wildlife using habitat in the vicinity of the noise. This would be most likely to occur related to the forested habitat provided by Wetland E2-4 to the north of the site. Construction noise could temporarily displace pileated woodpeckers transiting over the site to forage in Wetlands E2-3 or E2-4. Wildlife species would be expected to return after construction.

SR 520 Alternative

Short-term vegetation disturbance outside the project footprint is expected to be minimal to none. Vegetation is disturbed would be replanted, with an opportunity to increase native vegetation cover and decrease invasive species cover. Construction noise would have the least impact of the build alternatives given the current level of noise and development already on site.

4.2.2 Permanent Operational Impacts

4.2.2.1 Impacts Common to All Build Alternatives

Vegetation Removal and Habitat Alteration

Much of the vegetation within the project footprint would be removed and replaced with impervious surfaces. This would increase the proportion of each site that is developed compared with existing conditions (Table 4.2-1). All build alternatives would affect wildlife via direct loss of habitat.

Table 4.2-1. Potential Impacts on Vegetation and Wildlife Habitat

Alternative	Total Area of the Site (acres)	Permanent Operational Impacts						Permanent Change in Developed Extent	
		Acres removed by Vegetation Class					Total Direct Impacts (acres)[a]	Existing Conditions (% of total)	Build Alternatives (% of total)
		UMVC	UMVD	UMVM	UMV	USV			
Lynnwood Alternative									
Design Option C1	38	3	3	<1	3	2	11	17 (45%)	28 (74%)
Design Option C2	42	3	3	<1	3	2	11	16 (38%)	27 (64%)
Design Option C3	40	3	3	<1	3	2	11	19 (48%)	30 (75%)
BNSF Storage Tracks	15	0	<1	<1	<1	<1	<1	12 (80%)	12 (80%)
BNSF Alternative	27	0	1	<1	<1	2	3	22 (81%)	25 (93%)
BNSF Modified Alternative	39	0	4	<1	<1	2	6	30 (77%)	31 (79%)
SR 520 Alternative	26	0	<1	<1	0	2	2	24 (92%)	26 (100%)

[a] Acres of removed vegetation.

Noise and Human Disturbance

All of the build alternatives are in urban environments where wildlife have already habituated to a certain level of noise and activity from highways, residential areas, commercial development, and transit corridors. The degree to which operational impacts may increase or decrease noise levels and disturbance of wildlife is described by build alternative in Section 4.2.2 2 Specific Operational Impacts of Alternatives.

ESA-Listed Species and State Priority Species and Habitats

No state or federal threatened or endangered wildlife or plant species would be affected by any of the alternatives. Any of the candidate species, species of concern, sensitive species, or monitor species listed in Table 3.3-3 could be affected slightly through small losses of habitat if these species are present in the study area. The only documented occurrence of a priority species at any of the alternative sites is that of pileated woodpecker in association with the Lynnwood Alternative site. Impacts on this species are discussed in Section 4.2.2.2, Specific Operational Impacts of the Alternatives. None of the build alternatives in Bellevue would affect snag recruitment or foraging habitat for pileated woodpeckers in Wetlands E2-3 or E2-4. Priority habitats listed in Table 3.3-4 are discussed by alternative in Section 4.2.2.2, Specific Operational Impacts of Alternatives.

Noxious Weeds

Noxious weeds and exotic plants rapidly colonize disturbed sites such as construction areas. They prevent native species from becoming re-established following ground disturbance, spread into undisturbed areas, and provide poor wildlife habitat or forage. Several of the BMPs that would be implemented during project construction are intended to avoid, reduce, and control new infestations of noxious weeds (Appendix A). Given the widespread occurrence of Himalayan blackberry (*Rubus armeniacus*) and other invasive plant species in the project area under current

conditions, all of the Build Alternatives provide opportunity to at least temporarily reduce noxious weeds through vegetation removal.

4.2.2.2 Specific Operational Impacts of the Alternatives

Construction of the proposed project would have permanent operational impacts on vegetation and wildlife habitat in the project vicinity. These include mostly direct and some potential indirect impacts. The following sections outline the range of potential impacts that could occur for each alternative. Actual impacts would depend on the final alternative selection and design, construction footprint and methods, BMPs implemented during construction, and performance of post-construction wetland and buffer restoration.

The potential permanent operational impacts by alternative are summarized in Table 4.2-1 and Figures 4.2-1 through 4.2-4 and described in detail below.

Lynnwood Alternative

Approximately 6 acres of deciduous and coniferous forested habitat (i.e., UMVD and UMVC) would be permanently removed from the Lynnwood component of the Lynnwood Alternative under each of the three design options (i.e., C1, C2, and C3), increasing the proportion of the site that is developed from 38 to 48% developed under existing conditions to 64 to 75% developed, depending on the design option. Approximately 1.6 to 1.8 acres (depending on the design option) of this habitat is forested wetland (Figure 4.2-1a). Wetland N1-1 is part of the Swamp Creek wetland complex identified by WDFW as a priority habitat. While no priority species sightings are known at this site, pileated woodpeckers have foraged in snags in the wetland and are likely to occur there. Other priority species, such as bats or purple martins could use the area for foraging or even breeding. Impacts would include a decrease in forest and wetland habitat patch size, a possible decrease in snags, and decreased snag-recruitment potential. Loss of snags could affect the foraging suitability of Wetland N1-1 for pileated woodpeckers. If there are changes in hydrology that occur as a result of the 1.6 to 1.8 acres of proposed project impacts on the western portion of the wetland (e.g., increased fluctuations in water level, change in duration of ponded water) this could have an impact on amphibian breeding.

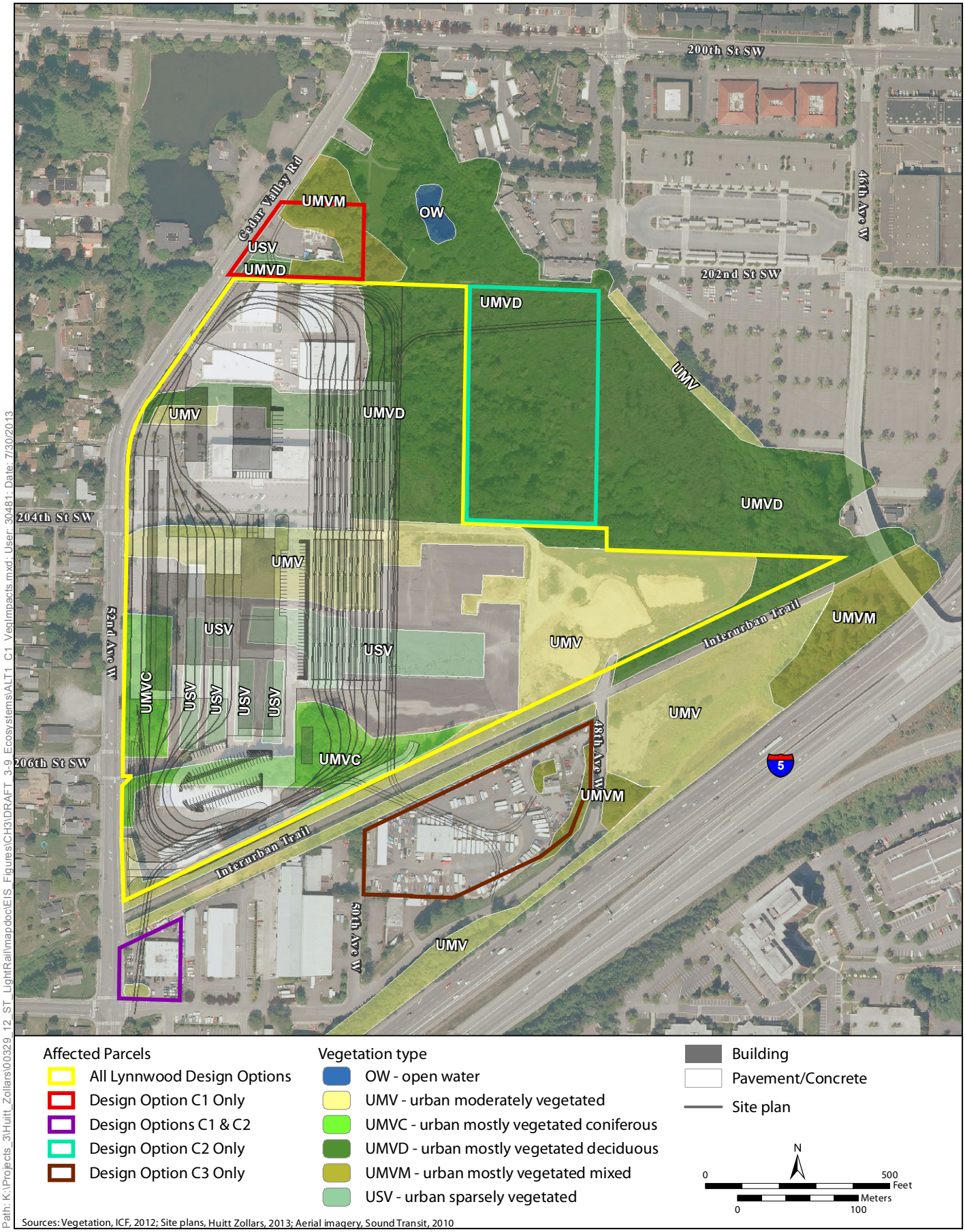

Figure 4.2-1a: Lynnwood Alternative—Vegetation Impacts
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Figure 4.2-1b: Lynnwood Alternative, BNSF Storage Tracks*—Vegetation Impacts
Ecosystems Technical Report
*The BNSF Storage Tracks are located in Bellevue

Figure 4.2-2: BNSF Alternative—Vegetation Impacts
Ecosystems Technical Report

Figure 4.2-3: BNSF Modified Alternative—Vegetation Impacts
Ecosystems Technical Report

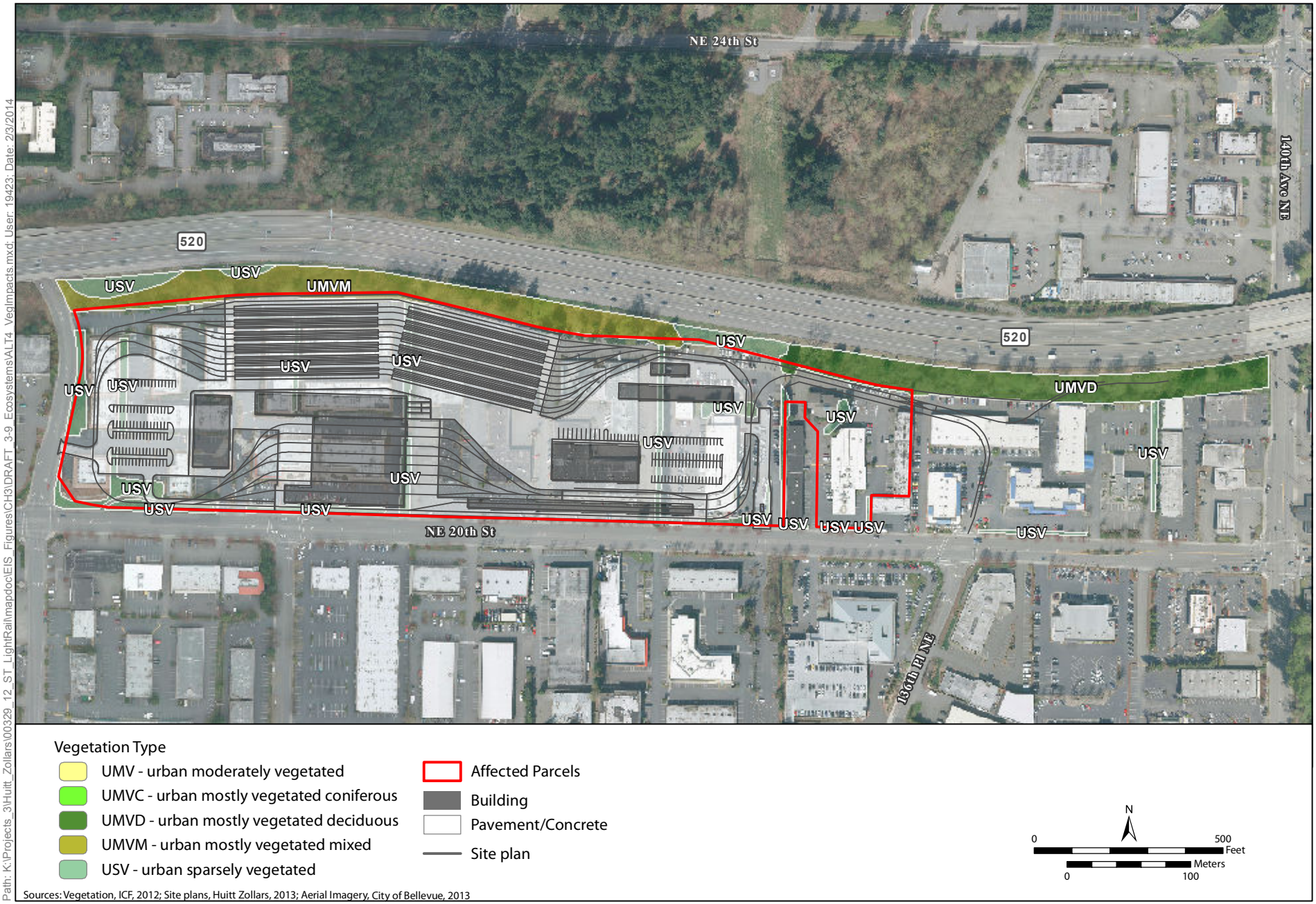

Figure 4.2-4: SR 520 Alternative—Vegetation Impacts
Ecosystems Technical Report

Design Option C2 of the Lynnwood Alternative would have a greater impact on wildlife than Design Option C1 or Design Option C3. Under Design Option C2, the lead track running east from the site would be constructed near the middle of the wetland. Lead tracks for Design Option C1 and Design Option C3 follow currently developed routes along the edges of the wetland. Thus Design Option C2 has a greater potential to bring noise and disturbance through the middle of the wetland.

Design Option C1 and Design Option C3 would have less impact in terms of habitat fragmentation and human disturbance because they would follow already developed routes. Under Design Option C1, lead tracks would follow I-5 and 52nd Avenue West, where noise and human disturbance from traffic are already high. The tracks would be located along the edge of the wetland, and thus would contribute less to habitat fragmentation than Design Option C2. Under Design Option C3, the lead tracks would enter and exit over I-5, an area already highly affected by noise and human activity and at the edge of the wetland as opposed to the middle.

A certain number of significant trees (mainly mature Douglas-fir trees) would be lost. Trees would be replanted to replace trees of significance as prescribed in the Lynnwood Municipal Code. However, there would be a temporal loss of mature trees from the site until replaced trees mature to the same age and stature as the existing trees (approximately 40 to 60 years).

The Bellevue component (BNSF Storage Tracks) of the Lynnwood Alternative would affect approximately 0.2 acres of forested habitat, some of which is wetland along the railroad tracks (Figure 4.2-1b). This alternative would not affect snag recruitment or foraging habitat for pileated woodpeckers in Wetlands E2-3 or E2-4. Given the highly (80 %) developed character of this site and the small amount of high quality habitat present, impacts from the project operation are expected to be minimal.

BNSF Alternative

Less than 2 acres of coniferous and deciduous forest (i.e., UMVM and UMVD) habitat would be removed permanently for the construction of the BNSF Alternative (Figure 4.2-2). Much of this forest is composed of the small wetlands scattered within this site. This habitat is already highly fragmented and affected by traffic noise and surrounding development. The proposed project would increase the percent of the site that is developed from 81% to 93%. Nonetheless, it is currently used by songbirds, small mammals, and other species, and this habitat would be lost.

Overall permanent impacts on wildlife are expected to be minimal. In accordance with the Migratory Bird Treaty Act, Sound Transit would consult with USFWS on methods to implement during construction to avoid impacts on migratory birds.

The peregrine falcon eyrie at Bellevue Tower, should it become active again, would likely not be affected due to distance from the proposed project and the urban nature of the existing surroundings (i.e., peregrines nesting in Bellevue are already adapted to high levels of noise and human development). There would be no impacts on the osprey nest at Hidden Valley Sports Park, given the lack of suitable habitat at the Alternative site. This alternative would not affect snag recruitment or foraging habitat for pileated woodpeckers in Wetlands E2-3 or E2-4.

BNSF Modified Alternative

Approximately four acres of high quality mixed coniferous and deciduous forest (i.e., UMVM and UMVD) habitat would be removed permanently under the BNSF Modified Alternative (Figure 4.2-3).

Much of this forest is the small wetlands scattered within the eastern portion of the site, as well as the southern portion of Wetland E1-1a along the western portion of the site. This habitat is already highly fragmented and affected by traffic noise and surrounding development. Nonetheless, it is currently used by songbirds, small mammals, and other species, and this habitat would be lost.

Overall impacts on wildlife, both long and short-term, are expected to be minimal. In accordance with the Migratory Bird Treaty Act, Sound Transit would consult with USFWS on methods to implement during construction to avoid impacts on migratory birds.

The peregrine falcon eyrie at Bellevue Tower, should it become active again, would not be affected due to distance from the proposed project and the urban nature of the existing surroundings (i.e., peregrines nesting in Bellevue are already adapted to high levels of noise and human development). There would be no impacts on the osprey nest at Hidden Valley Sports Park given the lack of suitable habitat. This alternative would not affect snag recruitment or foraging habitat for pileated woodpeckers in Wetlands E2-3 or E2-4.

SR 520 Alternative

Due to the limited amount of high quality habitat and the highly developed nature of this site, this alternative would have the least impact on wildlife of the four action alternatives. Approximately 0.5 acre of deciduous and mixed forest (i.e., UMVD and UMVM) and 2 acres of landscaping (i.e., USV) would be removed permanently (Figure 4.2-4). The majority of this habitat exists in a linear corridor located between SR 520 and commercial development. The understory of these forested areas is dominated by invasive Himalayan blackberry. Although this area is mapped as high value habitat (i.e., UMVM and UMVD), the habitat value is diminished by small patch size, lack of corridors, noise, and human disturbance. There is limited connectivity to larger habitat patches (particularly for species that cannot fly) and the highway and other roads make dispersal of amphibians and most small mammals to and from this site unlikely. Birds and larger mammals face the hazard of having to cross SR 520 and major local roads to reach this habitat. A couple of snags that provide foraging habitat for woodpeckers would be lost. A few potential perch trees for raptors would also be lost.

4.3 Wetland Resources

Temporary construction and permanent operational wetland impacts are described by wetland, rather than by wetland vegetation type within each wetland due to the level of detail possible at this stage in the EIS process (e.g., based on a largely reconnaissance-level field evaluation without a formal delineation). Direct and indirect impacts are described where applicable. Impacts by wetland vegetation type in each wetland would be developed during preparation of the permit application for the selected alternative in order to appropriately quantify impacts and determine appropriate compensatory impacts for wetland functions.

4.3.1 Temporary Construction Impacts

4.3.1.1 Impacts Common to All Build Alternatives

The duration of temporary impacts on wetlands can vary depending on the type of vegetation that is affected. For instance, temporary impacts on emergent wetlands are generally short-term, lasting for a limited time, with functions returning to pre-impact performance fairly soon (about 1 year or

within one growing season of the impact). In contrast, temporary impacts on woody vegetation (i.e., shrubs and trees) are generally longer-term because although functions can be restored over time, there is a temporal loss in function because of the time required for shrubs and/or trees to grow enough to regain the stature and size necessary to provide preconstruction functions such as canopy habitat. Short-term and long-term temporary impacts were previously defined in detail Section 1.4.1.1.

Temporary impacts from construction activities include both those impacts that are direct and indirect. Potential temporary direct impacts include the following:

- Vegetation clearing and temporary site grading and filling for construction access. After construction, contours in these areas would be restored to pre-project conditions and typically planted with native vegetation. In those areas where existing vegetation is dominated by invasive species (such as Himalayan blackberry), temporary impacts of vegetation clearing would be an essential first step for ultimate restoration of native species.

Temporary indirect impacts on wetland function include the following:

- Soil compaction during construction activities that contributes to a decrease in soil permeability, infiltration, water-storage capacity, and vegetation regrowth
- Accidental spills of fuel oils, chemicals, and/or concrete leachate used during construction that affect aquatic species
- Noise and human activity associated with construction activities that temporarily displace wildlife
- Increase in sediment loading and turbidity from grading and filling activities that could run off into wetlands and affect water quality
- Temporary changes in wetland hydrology due to soil compaction or access road construction
- Introduction of invasive species as a result of disturbance and construction activity
- Reduction in extent of existing invasive species as a result of construction clearing and revegetation

4.3.1.2 Specific Temporary Construction Impacts of Alternatives

Construction of the proposed project could have temporary construction impacts on wetlands. However, the amount of wetlands that would be affected by project construction under the alternatives cannot be determined because construction limits have not been defined in all parts of the study area at the level of design used for the Draft EIS analysis.

The analysis of potential construction impacts did not identify any areas where temporary impacts could extend beyond the study area defined for the analysis of operational impacts. For the ecosystems analysis, all temporary impacts were assumed to occur within the defined project limits and it is assumed that the level of temporary construction impacts would be commensurate with the level of long-term impacts for each build alternative.

The following sections outline the range of potential temporary construction impacts on wetlands that could occur for each alternative. Actual impacts would depend on the final alternative selection and design, construction footprint and methods, BMPs implemented during construction, and

performance of post-construction restoration. Direct construction impacts will be identified during the Final EIS and permitting phases.

Lynnwood Alternative

Construction activities at the Lynnwood Alternative site are expected to include construction and fill within the western portion of Wetland N1-1, as well as Wetland N1-3 at the southwestern corner of the site and potential wetland PWLY2 in the center of the site. It is expected that the implementation of appropriate BMPs, as described in Section 4.1 and in Appendix A, would avoid or minimize temporary construction impacts on any portions of the wetlands not permanently affected by the project footprint. For example, the use of temporary work bridges, where appropriate, would minimize temporary construction impacts on the Scriber Creek/Wetland N1-1 complex during construction.

Design Option C1

Temporary impacts of Design Option C1 would be the same as those described above for the Lynnwood Alternative site, with the addition of possible temporary impacts on the narrow northwestern portion of Wetland N1-1 during the placement of the three guideway support footings which would be constructed in the northwestern arm of the wetland (Figure 4.3-1a). This could result in the temporary loss of wetland habitat during construction (as well as permanent impacts as described below in Section 4.3.2.2). Support footings at the extreme southwestern corner of the site would be constructed in wetland buffer (Wetland N1-3) and could result in temporary construction impacts.

Design Option C2

Temporary impacts of Design Option C2 would be the same as those described above for the Lynnwood Alternative site and for Design Option C2, except that this option would also include the placement of guideway support footings across the center of Wetland N1-1 (Figure 4.3-1a), resulting in the temporary loss of wetland habitat during construction (as well as permanent impacts as described below in Section 4.3.2.2). Temporary work bridges would be used, where appropriate, to minimize effects on this wetland complex during construction of these support footings.

Design Option C3

Temporary impacts of Design Option C3 would be the same as those described above for the Lynnwood Alternative site. None of the guideway support footings would be constructed in wetlands (Figure 4.3-1a). Support footings at the extreme southwestern corner of the site would be constructed in wetland buffer (Wetland N1-3) and could result in temporary construction impacts.

BNSF Storage Tracks

The BNSF Storage Tracks component of this alternative is expected to include construction and fill within several of the wetlands along the eastern side of the existing BNSF tracks (permanent impacts are described below in Section 4.3.2.2) (Figure 4.3-1b). It is expected that the implementation of appropriate BMPs, as described in Section 4.1 and in Appendix A, would avoid or minimize temporary construction impacts on any portions of the wetlands that would not be permanently affected by the project footprint site.

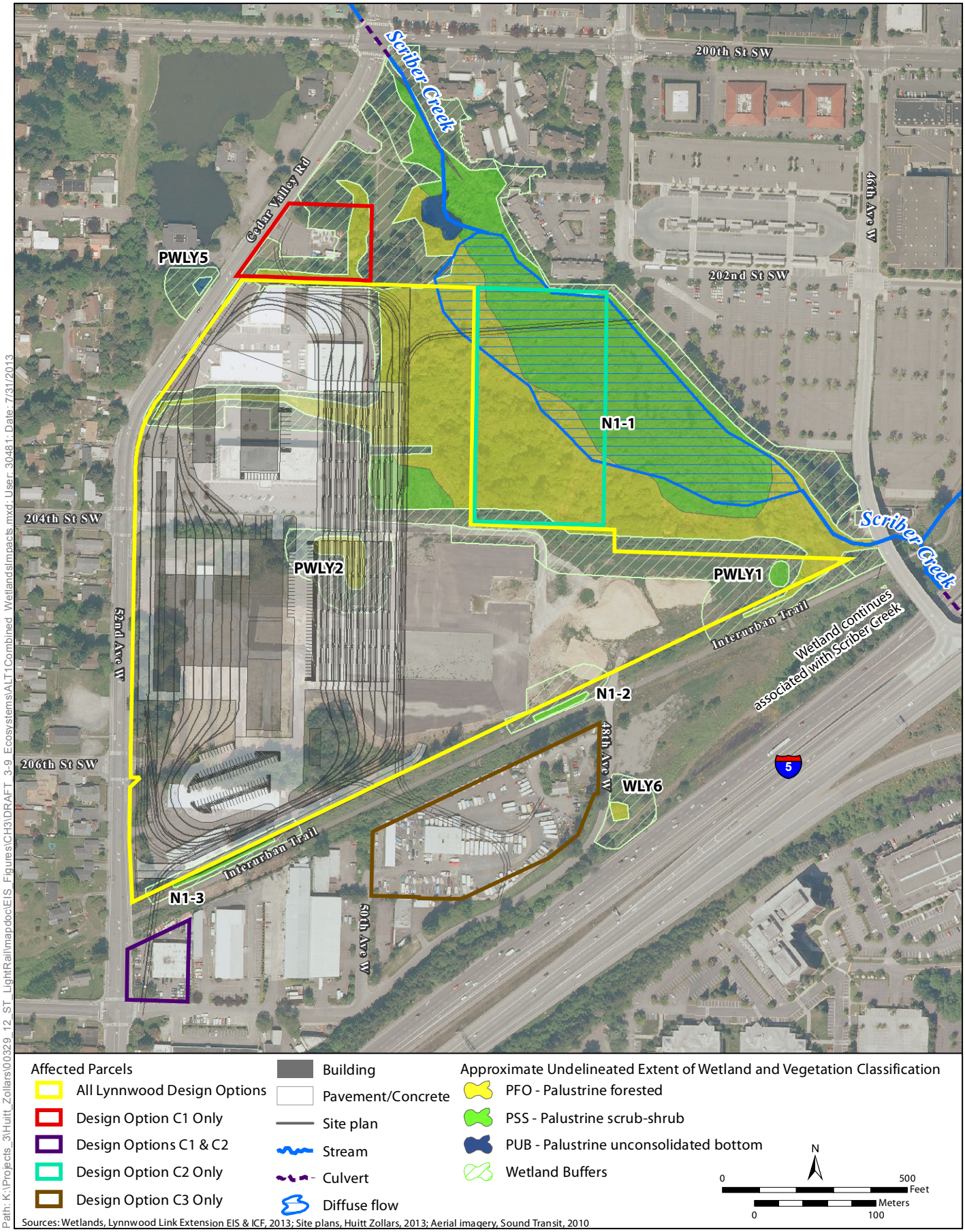

Figure 4.3-1a: Lynnwood Alternative—Wetland Impacts
Ecosystems Technical Report

Figure 4.3-1b: Lynnwood Alternative, BNSF Storage Tracks*—Wetland Impacts
Ecosystems Technical Report
*The BNSF Storage Tracks are located in Bellevue

BNSF Alternative

Construction activities associated with this alternative are expected to include construction and fill within at least a portion of all of the wetlands located along the eastern side of the existing BNSF tracks (permanent impacts are described below in Section 4.3.2.2). The potential types of temporary construction impacts of this alternative would be similar to those described above, in Section 4.3.1.1, *Impacts Common to All Build Alternatives*. It is expected that the implementation of appropriate BMPs, as described in Section 4.1 and in Appendix A, would avoid or minimize temporary construction impacts on any portions of the wetlands not permanently affected during construction activities this site.

BNSF Modified Alternative

The potential temporary construction impacts of this alternative would be the same as those discussed above for the BNSF Alternative, with the additional potential for temporary impacts on Wetlands E1-1a and E1-1b during construction. It is expected that the implementation of appropriate BMPs, as described in Section 4.1 and in Appendix A, would avoid or minimize temporary construction impacts on any portions of the wetlands not permanently affected during construction activities this site.

SR 520 Alternative

Construction activities associated with this alternative are expected to include construction and fill within three of the five of the wetlands (permanent impacts are described below in Section 4.3.2.2). The potential temporary construction impacts of this alternative would be similar to those described above, in Section 4.3.1.1-*Impacts Common to All Build Alternatives*. It is expected that the implementation of appropriate BMPs, as described in Section 4.1 and in Appendix A, would avoid or minimize temporary construction impacts on any portions of the wetlands not permanently affected during construction activities this site.

4.3.2 Permanent Operational Impacts

4.3.2.1 Impacts Common to All Build Alternatives

Direct Wetland and Buffer Impacts from the Facilities

The project limits include the OMSF footprint, including parking, roadway improvements, changes to storm drainage, and other ancillary features. Permanent direct impacts are those that occur inside the project limits where the permanent components of each alternative would occur. It is assumed that these areas would be permanently affected and all wetlands and functional portions of wetland buffers within these areas would be filled and all related functions lost in their entirety. Mitigation consistent with federal, state, and local requirements would be required for wetland impacts. Mitigation for buffer impacts may also be required under local Critical Area Ordinances.

Wetland and Buffer Impacts from the Elevated Guideways

Wetlands and wetland buffers occur under the elevated guideways linking the proposed project with the Lynnwood Link or East Link projects (as applicable). Impacts can occur to wetlands beneath such guideways, even if the direct fill footprint is confined to the area of the support

columns. However, estimating this impact is complicated and depends on multiple variables, such as slope, aspect, soil conditions, and stormwater dispersion from the elevated guideway. Wetlands typically receive water from groundwater or surface water sources. Vegetation within buffer areas typically receives water directly from precipitation. Elevated guideways can create a rainshadow effect and in some cases might also have a low clearance that could also limit sunlight. Sound Transit has observed situations at several locations along Sound Transit's Central Link route where vegetation replanted within buffers under the elevated guideway was having difficulty re-establishing due to limited summer water and/or light (Sound Transit 2011). All these variables make for a complex impact analysis that exceeds the site and design information available during the EIS development.

Therefore, for the purposes of this impact analysis, permanent impacts from the elevated guideways were calculated in a conservative manner, based on the overlap of the total area of the guideway on the wetland or wetland buffer. It is expected, however, that permanent impacts on wetlands associated with any elevated sections of guideway track can be avoided or further minimized during final design and during construction. During future design and permitting, impacts on wetlands under elevated portions of the structures would be evaluated more closely to determine whether the expected vertical clearance over wetlands would allow sufficient sunlight and precipitation to restore some wetlands and buffer functions.

Indirect Wetland and Buffer Impacts

Permanent indirect impacts might also occur as a result of construction and operation activities. Indirect wetland impacts are those areas of wetlands that will not be directly filled but could reasonably be expected to be vegetatively and/or hydrologically affected by the fill. An example is an area of wetland that is cut off/isolated from the main body of the wetland by the fill. This area might remain wetland but its water quality, hydrologic, and habitat functions are so reduced by its isolation and small size as to render it affected. The remaining portion of a buffer narrowed significantly because of construction may not provide functional buffer to the wetland. Potential permanent indirect impacts considered included the following:

- Conversion of forested to scrub-shrub wetland habitat under and along the sides of the elevated guideways by regular maintenance to prevent trees and branches from interfering with rail operation
- Alterations to vegetation community structure and species diversity caused by partial shading of vegetation from shadows cast beyond the elevated structure footprint
- Alterations to depth and duration of soil saturation and/or seasonal ponding due to isolation from main body of the wetland caused by fill
- Alterations to the vegetative character, interspersion of habitats, and complexity of wetland habitat functions caused by isolation of the wetland from the main body of the wetland by fill or by such a substantial reduction in the remaining portion of the wetland or wetland buffer that all habitat functions are eliminated

Mitigation consistent with federal, state, and local requirements would likely be required for indirect wetland impacts.

4.3.2.2 Specific Impacts of the Alternatives in Each Segment

Construction of the proposed project could have permanent operational impacts on wetlands and wetland buffers in the project vicinity. These include mostly direct and some potential indirect impacts. The following sections outline the range of potential impacts that could occur for each alternative. Actual impacts would depend on the final alternative selection and design, construction footprint and methods, BMPs implemented during construction, and performance of post-construction wetland and buffer restoration.

The potential permanent operational impacts by alternative are summarized in Table 4.3-1 and Figures 4.3-1 through 4.3-4 and described in detail below.

Table 4.3-1. Potential Permanent Operational Impacts on Wetland and Wetland Buffers

Wetland ID	Cowardin Class[a]	HGM Class[b]	Category[c]	Approximate Total Size (acres)	Direct Wetland Impacts (acres)	Indirect Wetland Impacts (acres)	Wetland Buffer Impacts (acres)[d]
Lynnwood Alternative, Design Option C1							
N1-1	PFO1/PSS1/ PEM1/PUB	Depressional/ Riverine	II	17	1.6	0.1	1.4
N1-2	PSS1	Depressional	III	0.1	0.0	0.0	0.0
N1-3	PSS1	Depressional	III	0.1	<0.1	<0.1	0.2
WLY6	PFO1	Depressional	III	0.05	0.0	0.0	0.0
PWLY1	PSS1	Depressional	III	0.1	0.0	0.0	0.0
PWLY2	PFO1	Depressional	III	0.3	0.3	0.0	0.0
PWLY5	PUB	Depressional	III	<0.1	0.0	0.0	0.0
Lynnwood Alternative, Design Option C1: Total Wetland Impacts					***1.9***	***0.1***	***1.6***
Lynnwood Alternative, Design Option C2							
N1-1	PFO1/PSS1/ PEM1/PUB	Depressional/ Riverine	II	17	1.8	0.1	1.4
N1-2	PSS1	Depressional	III	0.1	0.0	0.0	0.0
N1-3	PSS1	Depressional	III	0.1	<0.1	<0.1	0.2
WLY6	PFO1	Depressional	III	0.05	0.0	0.0	0.0
PWLY1	PSS1	Depressional	III	0.1	0.0	0.0	0.0
PWLY2	PFO1	Depressional	III	0.3	0.3	0.0	0.0
PWLY5	PUB	Depressional	III	<0.1	0.0	0.0	0.0
Lynnwood Alternative, Design Option C2: Total Wetland Impacts					***2.1***	***0.1***	***1.6***
Lynnwood Alternative, Design Option C3							
N1-1	PFO1/PSS1/ PEM1/PUB	Depressional/ Riverine	II	17	1.6	0.1	1.4
N1-2	PSS1	Depressional	III	0.1	0.0	0.0	0.0
N1-3	PSS1	Depressional	III	0.1	<0.1	<0.1	0.2
WLY6	PFO1	Depressional	III	0.05	0.0	0.0	0.0
PWLY1	PSS1	Depressional	III	0.1	0.0	0.0	0.0
PWLY2	PFO1	Depressional	III	0.3	0.3	0.0	0.0

Wetland ID	Cowardin Class[a]	HGM Class[b]	Category[c]	Approximate Total Size (acres)	Direct Wetland Impacts (acres)	Indirect Wetland Impacts (acres)	Wetland Buffer Impacts (acres)[d]
PWLY5	PUB	Depressional	III	<0.1	0.0	0.0	0.0
Lynnwood Alternative, Design Option C3: Total Wetland Impacts					***1.9***	***0.1***	***1.6***
Lynnwood Alternative, BNSF Storage Tracks							
E1-1b	PFO1/PEM1	Depressional	III	0.06	0.06	0.0	0.07
E2-1	PFO1	Depressional	III	0.4	0.0	0.0	0.08
E2-2	PFO1/PSS1	Depressional	III	0.02	<0.001	0.0	0.04
E2-3	RFO1	Depressional and Riverine	III	1.2	0.0	0.0	0.0
E2-4	PFO1/4	Depressional	III	5.5	0.0	0.0	0.0
E2-5	PFO1/PSS1	Depressional	IV	0.2	0.0	0.0	0.0
E2-6	PEM1	Depressional	III	0.06	<0.001	<0.01	0.0
E2-7	PFO1	Depressional	III	0.02	0.02	0.0	
Lynnwood Alternative, BNSF Storage Tracks: Total Wetland Impacts					***0.08***	***<0.01***	***0.19***
BNSF Alternative							
E2-1	PFO1	Depressional	III	0.4	0.02	0.0	0.25
E2-2	PFO1/PSS1	Depressional	III	0.02	0.02	0.0	0.0
E2-3	RFO1	Depressional and Riverine	III	0.6	0.0	0.0	0.0
E2-4	PFO1/4	Depressional	III	5.5	0.0	0.0	0.0
E2-5	PFO1/PSS1	Depressional	IV	0.2	0.0	0.0	0.0
E2-6	PEM1	Depressional	III	0.06	<0.01	<0.01	0.0
E2-7	PFO1	Depressional	III	0.02	0.02	0.0	0.0
BNSF Alternative: Total Wetland Impacts					***0.07***	***<0.01***	***0.25***
BNSF Modified Alternative							
E1-1a	PFO1/PSS1/ PEM1	Depressional and Slope	III	1.2	0.37	0.8	1.05
E1-1b	PFO1/ PEM1	Depressional	III	0.06	0.06	0.0	0.0
E2-1	PFO1	Depressional	III	0.4	0.04	0.0	0.28
E2-2	PFO1/PSS1	Depressional	III	0.02	0.02	0.0	0.0
E2-3	RFO1	Depressional and Riverine	III	0.6	0.0	0.0	0.0
E2-4	PFO1/4	Depressional	III	5.5	0.0	0.0	0.0
E2-5	PFO1/PSS1	Depressional	IV	0.2	0.0	0.0	0.0
E2-6	PEM1	Depressional	III	0.06	0.06	0.0	0.0
E2-7	PFO1	Depressional	III	0.02	0.02	0.0	0.0
BNSF Modified Alternative: Total Wetland Impacts					***0.6***	***0.8***	***1.33***
SR 520 Alternative							
E3-1	PFO1	Depressional	IV	0.2	0.0	0.0	0.18
E3-2	REM	Riverine	IV	0.2	0.2	0.0	0.0
E3-3	PSS1/PEM1	Depressional	III	0.1	0.1	0.0	0.0

Wetland ID	Cowardin Class[a]	HGM Class[b]	Category[c]	Approximate Total Size (acres)	Direct Wetland Impacts (acres)	Indirect Wetland Impacts (acres)	Wetland Buffer Impacts (acres)[d]
E3-4	PFO1	Depressional	III	0.1	0.0	0.0	0.02
E3-5	PFO1/PSS1/ PEM1	Depressional and Slope	III	0.6	0.09	0.0	0.09
SR 520 Alternative: Total Wetland Impacts					0.39	0.0	0.29

[a] *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979): PEM = palustrine emergent marsh; PSS1 = palustrine scrub-shrub, deciduous; PFO1= palustrine forested, deciduous; PFO1/4 = palustrine forested, mixed deciduous and coniferous; REM = riverine, emergent

[b] HGM = hydrogeomorphic classification

[c] Category is based on the *Washington State Wetland Rating System for Western Washington*(Hruby 2006), which the cities of Bellevue and Lynnwood adopted without modification.

[d] No buffer impacts if wetland is entirely affected.

Lynnwood Alternative

This alternative would result in fill within the western portion of the Scriber Creek wetland (i.e., Wetland N1-1) and direct impacts on the northern half of Wetland N1-3 (Figure 4.3-1a). Impacts on Wetland N1-1 would result in the reduction of forested and shrub wetland habitats, as well as the potential for changes to surface flow paths in the wetland associated with the area of diffuse flow where Scriber Creek merges into the wetland. Placement of fill in the western portion of the wetland would also reduce the wetland area available to store floodwaters in the Scriber Creek floodplain, thus partially reducing the wetland's water quality and hydrologic functions.

Design Option C2 would have the largest impact on wetland and wildlife habitat due to the elevated guideway crossing the center of the wetland. Wetland N1-1 provides a large area of wildlife habitat in a highly urbanized area, and is part of a habitat corridor that stretches along Scriber Creek through Lynnwood and into Mountlake Terrace. Wetland N1-1 provides a high level of water quality improvement and flood flow reduction functions due to its capacity to hold stormwater and flood flows from the creek and its density of woody vegetation which slows flood flows and traps sediment and nutrients. Impacts from the Lynnwood Alternative (all design options) would affect the wetland's ability to perform water quality and hydrologic functions, and would reduce the amount of habitat that provided for wildlife.

Impacts on this wetland could also adversely affect juvenile salmon that rear and overwinter in the wetland/diffuse stream channel complex. The elevated guideways proposed under Design Option 2 would preclude the development of mature forested vegetation within the wetland along the tracks and would thus reduce the recruitment of large woody debris into Scriber Creek and the wildlife habitat values provided by standing snags and downed wood in the wetland.

However, stormwater treatment and flow control measures are included under all the design options, which would be expected to detain and treat stormwater from the proposed project. This would at least partially compensate for the loss of stormwater detention and treatment functions currently provided by the wetland.

Figure 4.3-2: BNSF Alternative—Wetland Impacts
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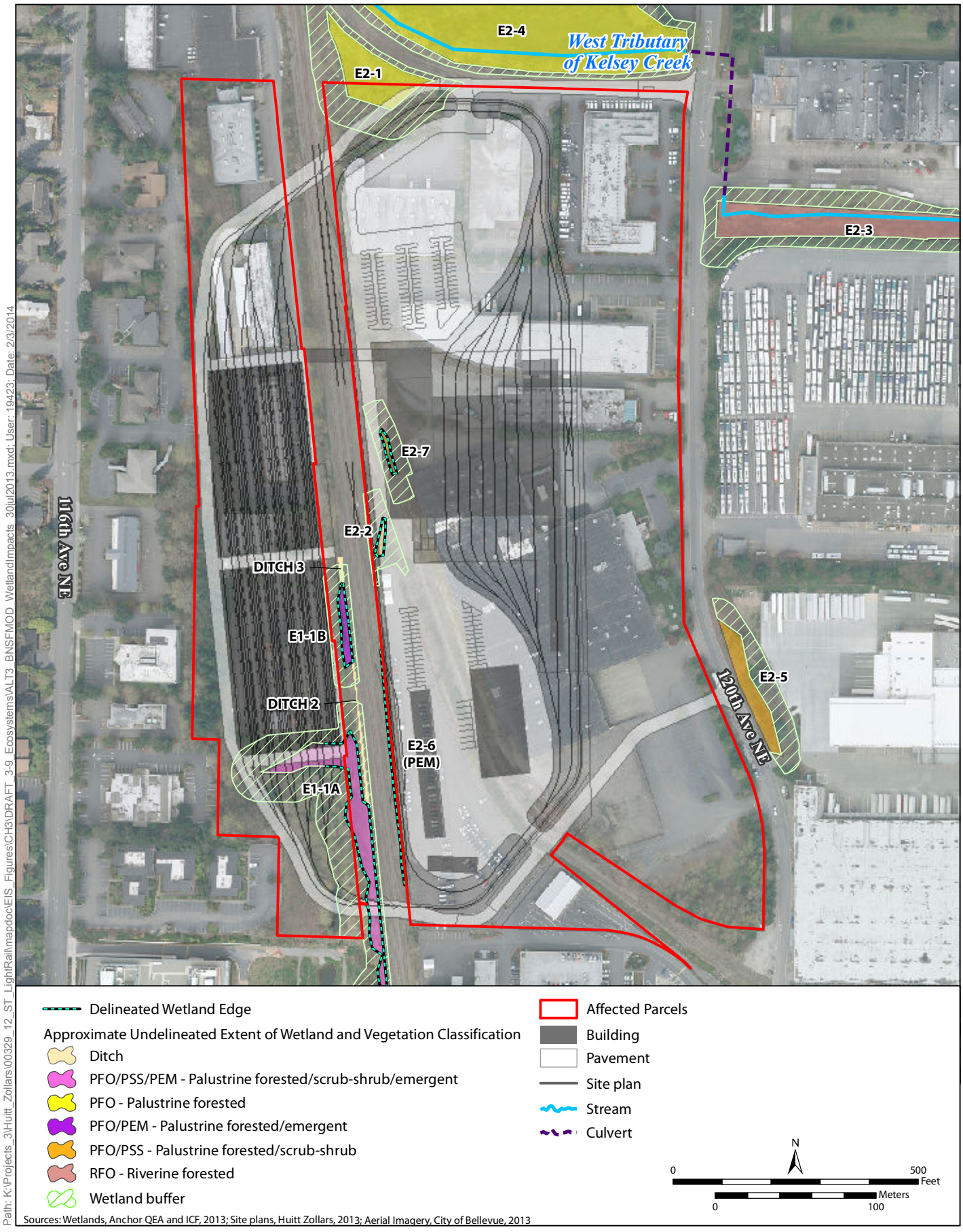

Figure 4.3-3: BNSF Modified Alternative—Wetland Impacts
Ecosystems Technical Report

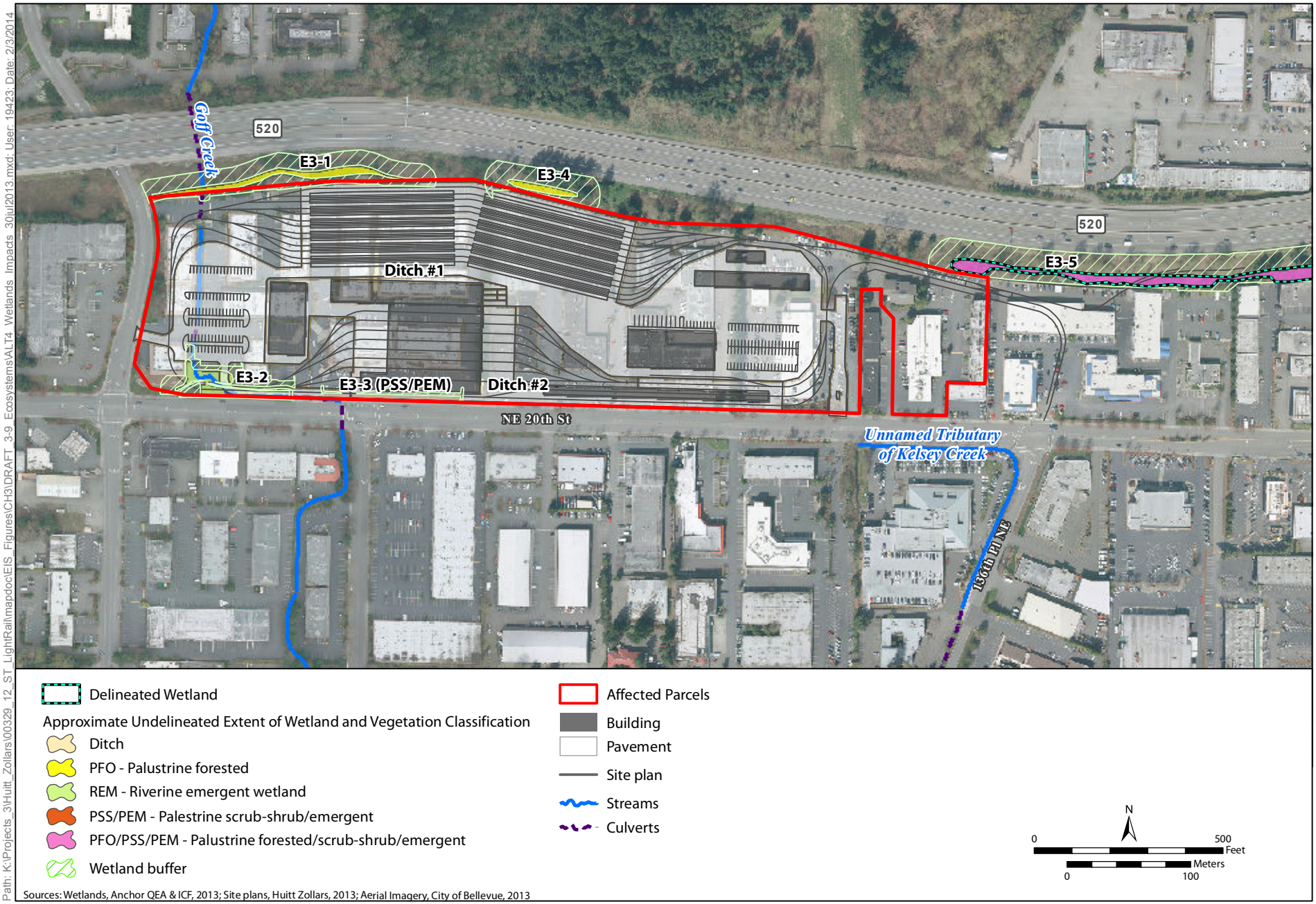

Figure 4.3-4: SR 520 Alternative—Wetland Impacts
Ecosystems Technical Report

It should be noted that approximately 0.4 acre of the narrow western arm of Wetland N1-1 and approximately 0.3 acre of the southwestern corner of Wetland N1-1 each appear to be potential mitigation sites constructed to compensate for wetland and/or buffer impacts. Both of these areas would be affected under all design options of this alternative. NGPA signage and native tree and shrub plantings were also noted around the narrow western arm of Wetland N1-1. The NGPA recording certificate for this area (#200405055120) specifically prohibits future development and requires any boundary adjustments to the NGPA be approved by the City of Lynnwood through a formal platting process. All design options of this alternative would affect the NGPA and trigger such a process for approval of any modification to the NGPA boundary to allow impacts on this portion of Wetland N1-1.

The northern half of Wetland N1-3 would be directly affected. Impacts on Wetland N1-3 would result in the reduction of scrub-shrub wetland habitat. Indirect impacts on the remaining southern sliver of this very narrow wetland are expected to eliminate all water quality, hydrologic, and habitat functions of this wetland and thus result in a total loss of the wetland.

Wetlands and wetland buffers under the elevated guideway associated with the Lynnwood Alternative would also be affected, as per the impact assumptions outlined above in Section 4.3.2.1.

Design Option C1

Wetland impacts associated with Design Option C1 would be similar to those described above for the Lynnwood Alternative site. This Design Option would result in approximately 1.6 acres of direct impact, 0.10 acres of indirect impact on Wetland N1-1 and approximately 1.4 acres of impact on Wetland N1-1's buffer (Figure 4.3-1a). Indirect impacts on the extreme western portion of the northwestern arm of the wetland are likely due to this area being isolated from the main body of the wetland by the tracks linking the proposed project to the Lynnwood Link Extension tracks (Figure 4.3-1a). The C1 Design Option is expected to result in approximately 0.2 acre less loss of habitat in the wetland complex adjacent to Scriber Creek than Design Option C2 because of the configuration of the track and the northwestern portion of Wetland N1-1.

All of Wetland N1-3 (approximately 0.1 acre) would be directly or indirectly affected as a result of this Design Option.

Design Option C2

Impacts on Wetlands N1-1 and N1-3 associated with Design Option C2 would be the same as those described above for the Lynnwood Alternative site, except that this Design Option would result in 0.2 acre more wetland impact than Design Option C1 (1.8 acres versus 1.6 acres) because of the track extending east through Wetland N1-1 to join track from the Lynnwood Link Extension (Figure 4.3-1a).

Design Option C3

Impacts on Wetland N1-1 and N1-3 associated with Design Option C3 would be the same as those described above for Design Option C1 (Figure 4.3-1a).

BNSF Storage Tracks

Wetland impacts associated with the BNSF Storage Tracks component of the Lynnwood Alternative would occur to Wetland E1-1b along the western side of the tracks, and to Wetlands E2-2, E2-6, and

E2-7 along the eastern side of the tracks (Figure 4.3-1b). A total of approximately 0.08 acre of wetland would be affected.

A total of approximately 0.19 acre of wetland buffer impact would occur under this alternative, affecting the buffers of Wetlands E1-1b, E2-1, E2-2, and E2-7.

BNSF Alternative

Wetland impacts associated with this alternative would occur to Wetlands E2-1, E2-2, E2-6, and E2-7, totally approximately 0.07 acre of direct wetland impact and approximately 0.25 acre of wetland buffer impact (Figure 4.3-2). This includes the complete fill of Wetlands E1-1b, E2-2 and E2-7, and the partial fill of Wetlands E2-1, and E2-6. Indirect wetland impacts would be expected to the southern portion of Wetland E2-6 due the filling of the northern portion of this narrow wetland.

BNSF Modified Alternative

Wetland impacts associated with this alternative would occur to Wetlands E2-1, E2-2, E2-6, E2-7, as well as to Wetland E1-1a and E1-1b, totally approximately 0.6 acre of direct wetland impact and approximately 1.33 acres of wetland buffer impact (Figure 4.3-3). This includes 0.4 acre of direct impact on Wetlands E1-1a and E1-1b, and 1 acre of Wetland E1-1a's buffer. Indirect wetland impacts would also be expected to the remaining portion of Wetland E1-1a (0.8 acre) due the degree of grading necessary for construction in this steeply sloped area, as well as to the southern portion of Wetland E2-6 due the filling of the northern portion of this narrow wetland.

The BNSF Modified Alternative would also include fill of Ditches #2 (approximately 349 linear feet) and #3 (approximately 63 linear feet) which are connected to Wetlands E1-1a and E1-1b.

SR 520 Alternative

Wetland impacts associated with this alternative would occur to three of the five wetlands within this site (Figure 4.3-4). The SR 520 Alternative would also include substantial modifications to Ditches #1 and #2.

This alternative would result in 0.39 acre of direct wetland impact on Wetlands E3-2, E3-3, and E3-5 and 0.29 acre of wetland buffer impact. Wetland E3-2 currently provides a limited floodplain for Goff Creek; Wetland E3-3 drains through pipes to Goff Creek. It should be noted that Wetland E3-3 (0.1 acre) appears to be a mitigation site constructed to compensate for wetland impacts.

The entirety of both Ditches #1 and #2 would also be filled and/or piped, totaling approximately 226 linear feet of Ditch #1 and approximately 20 linear feet of Ditch #2.

Chapter 5
Potential Mitigation Measures

Sound Transit's policy [Executive Order No. 1, Establishing a Sustainability Initiative for Sound Transit (2007)] on ecosystem mitigation is to avoid impacts on environmentally sensitive resources and provide adequate mitigation to ensure no net loss of ecosystem function and acreage as a result of agency projects. The OMSF project would mitigate impacts on ecosystem resources in accordance with the mitigation sequencing requirements established by NEPA, the CWA, and local Critical Areas Ordinances.

According to NEPA (40 Code of Federal Regulations [CFR] paragraphs 1508.20), mitigation for ecosystems impacts is based on a hierarchy of first avoiding the impact, then minimizing the impact by limiting the degree or magnitude of the action, rectifying the impact by restoring, repairing, or rehabilitating the affected environment, reducing or eliminating the impact over time, and finally compensating for any remaining unavoidable adverse impacts by providing substitute resources or environments.

As described below, the build alternatives for the proposed project would avoid or minimize potential impacts on ecosystems resources whenever practicable, and Sound Transit is committed to providing compensatory mitigation when avoidance is not practicable.

5.1 Avoidance and Minimization

The avoidance and minimization of impacts was a guiding principle in the preliminary design of the build alternatives. The build alternatives for the proposed project would avoid or minimize potential impacts on ecosystems resources whenever practicable. Sound Transit would comply with standard specifications, BMPs, and applicable federal, state, and local mitigation requirements during design, construction, and post construction activities. Sound Transit would meet all regulatory requirements and continue to implement proactive avoidance and minimization measures related to these BMPs in adherence with federal, state, and local regulations.

5.1.1 Construction Best Management Practices

BMPs have been developed to avoid and minimize impacts during construction. These BMPs involve implementing conditions set forth in a Hydraulic Project Approval (HPA), in WAC 220-110-070, for installing culverts during construction, Section 401 and Section 404 of the CWA, the National Pollutant Discharge Elimination System (NPDES) permit, and the development of a Stormwater Pollution Prevention Plan (SWPPP) that prescribes implementation of measures for identifying, reducing, eliminating, or preventing on-site sediment and erosion problems which could affect aquatic resources, wetlands, and associated wildlife habitat. Sound Transit or its construction contractor would also implement construction BMPs that would apply to all ecosystem sensitive areas. These include delineating construction limits with fencing and signage to prevent inadvertent impacts on riparian vegetation, wetlands, upland vegetation to be preserved, or other sensitive sites outside of construction limits and development of a Temporary Erosion and Sediment Control (TESC) plan to address the potential for erosion during construction. Example BMPs that would be

implemented under the TESC plan include silt fences, protective ground covers, and straw bales in drainage features.

BMPs would be implemented to limit soil compaction in sensitive areas, and temporary work bridges could be used in extremely sensitive areas, such as the Scriber Creek wetland complex. BMPs would be employed for fish and aquatic habitat protection. In-water and over water work will be avoided, except for the SR 520 Alternative, which would require piping a portion of Goff Creek. However, most construction activities will be conducted in the dry, before the stream reach is diverted. Efforts will be conducted to rescue any aquatic species, prior to dewatering or diverting any stream reaches. Disturbed or temporarily cleared riparian vegetation will be replanted, as soon as practicable, with suitable native species.

If an HPA is required, all work would comply with the terms and conditions set forth in the HPA issued for the project by the WDFW. Seasonal restrictions (i.e., work windows) would apply to work conducted below the ordinary high water mark (if any should be required). If any culverts need to be installed or extended on fish-bearing or potentially fish-bearing streams (e.g., during mitigation for Goff Creek impacts), design and construction would comply with WAC 220-110-070 regarding fish passage requirements. Any affected streambeds and stream banks would be restored after in-water work.

For water quality protection, the project would obtain a construction stormwater general permit for coverage under the NPDES permit program, which is required for certain construction activities. The goal of the permit is to reduce or eliminate stormwater pollution and other impacts on surface waters from construction sites. The project must also develop a construction stormwater pollution prevention plan that implements BMPs for identifying, reducing, eliminating, or preventing sediment and erosion problems on site. The construction stormwater pollution prevention plan would include a TESC plan; spill prevention, control, and countermeasures plan; concrete containment and disposal plan; dewatering plan; and a fugitive dust plan.

Measures would be implemented before and during project construction to avoid or minimize effects on vegetation and wildlife resources. These strategies would be implemented along with others designed to avoid or minimize effects on other resources, such as streams, wetlands, and soils. Examples of these strategies are minimizing vegetation clearing, restoring temporarily affected areas, preparing and implementing a revegetation plan, and implementing construction methods to avoid impacts on migratory birds. In accordance with federal, state, and local requirements and guidance, Sound Transit would implement appropriate measures to minimize the risk of introduction and spread of noxious and invasive species.

5.1.2 Design and Operation Best Management Practices

Sound Transit would also implement design and operation BMPs for permanent stormwater runoff treatment and flow control. These could include natural or engineered dispersion BMPs; biofiltration BMPs such as vegetated filter strips, biofiltration swales, or ecology embankments; wet-pool BMPs; and infiltration BMPs. The project would route drainage to maintain existing stream basin contributing areas.

5.2 Rectifying and Reducing Impacts over Time

To the extent that impacts cannot be avoided or minimized through BMPs, Sound Transit would implement restoration measures to rectify temporary impacts and reduce their effects over time. Immediately following construction in each project segment, Sound Transit would begin restoring temporarily disturbed wetlands, streams (if any work occurs below the OHWM of any streams), and buffer areas. The length of time that would be required for site restoration to effectively replace habitat functions would vary. Temporarily disturbed wetlands, streams, and their buffers would be restored to pre-construction conditions where feasible and planted with appropriate native species when construction activities are finished. Sound Transit will conduct detailed site surveys to reestablish topography. Restoration will include soil amendment and vegetation replacement. Upland forested vegetation disturbed within construction staging areas will be revegetated with native species within 1 year following construction. Invasive, nonnative vegetation will be removed permanently from temporarily affected areas to improve the overall habitat for wildlife.

5.3 Compensatory Mitigation

To the extent that impacts cannot be avoided or minimized through BMPs, or rectified after construction, Sound Transit would implement additional measures to reduce adverse effects and provide compensatory mitigation measures where adverse effects are unavoidable.

Each of the alternatives has the potential to permanently affect wetland and wetland buffer habitats. Sound Transit has committed to achieving no net loss of wetland function and area on a project-wide basis. Compensatory mitigation would be conducted in accordance with applicable federal, state, and local requirements and guidelines. These include the federal *Final Compensatory Mitigation Rule* (40 CFR Part 230); interagency guidance prepared by Ecology, the U.S. Army Corps of Engineers, and U.S. Environmental Protection Agency in *Wetland Mitigation in Washington State* (Washington State Department of Ecology et al. 2006); and local Critical Areas Ordinances for the Cities of Lynnwood and Bellevue.

The federal *Final Compensatory Mitigation Rule* (*Federal Register* CFR Part 230, Volume 73 No. 70, 19594–1970540) specifies that selection of mitigation sites be conducted with a watershed approach and that compensatory mitigation for wetland impacts be accomplished preferentially by the use of approved mitigation banks, then by the use of in-lieu fee programs, and finally through permittee responsible, project specific mitigation.

Mitigation for unavoidable impacts on other resources (e.g., streams, stream buffers, and fish and wildlife habitat/habitat for species of local importance) that are protected under local critical areas ordinances would also be conducted in accordance with the requirements of those ordinances (i.e., BMC 20.25H.080 and 20.25H.085 for streams and 20.25H.160 for habitat associated with species of local importance; LMC 17.10.064 for streams and 17.10.081 for wildlife). Sound Transit will also adhere to local ordinances regarding tree replacement ratios (e.g., replacement of significant trees per the LMC).

Habitat improvements to mitigate for effects on aquatic resources will provide the most benefits if they occur downstream of existing anadromous fish passage barriers (i.e., downstream of Bel-Red Road for impacts on Goff Creek or West Tributary of Kelsey Creek, and the lower reaches of Scriber Creek). Sound Transit will work with the cities of Lynnwood and Bellevue to define appropriate

mitigation that is consistent with, and complimentary to, local plans for ecosystem restoration. Mitigation could be also accomplished through a combination of site specific actions, and more basin-wide or programmatic actions such as by creating wider stream or riparian buffers, restoring native riparian areas, removal of nonnative, invasive vegetation, supporting environmental education, and through improved stormwater management.

For example, Sound Transit has met with the City of Bellevue to discuss the City's plans for daylighting and restoring portions of Goff Creek downstream of the SR 520 Alternative site and upstream of Bel-Red Road and to remove fish passage barriers. Sound Transit will continue to work with the city to determine ways in which mitigation for impacts on Goff Creek could be completed in compliment with the City's vision for the Bel-Red Corridor and restoration of Goff Creek and improving fish passage within the Unnamed Tributary of Kelsey Creek (City of Bellevue 2012).

5.3.1 Approved Mitigation Bank

Currently, there are no approved mitigation banks with service areas that include the subbasins in which wetland impacts would occur under the action alternatives. Although it is possible that a bank could become certified with service in the project area in the future, mitigation banking projects take considerable lead time for planning and approval.

5.3.2 King County In-Lieu Fee Program (Mitigation Reserves Program)

King County has developed an in-lieu fee program called the Mitigation Reserves Program, which was approved by the U.S. Army Corps of Engineers in March 2012 (King County 2013b). As of February 2012, the program is available throughout unincorporated King County. The program may be available to project proponents (such as Sound Transit) working within incorporated cities if the city codes allow it and if the city and King County have an agreement in place. However, as of February 2012 there are no such agreements in place (King County 2013c).

The program includes service areas within the King County watersheds affected by the OMSF (i.e., Cedar River/Lake Washington and Sammamish River). Sound Transit would discuss this program with the Cities of Lynnwood and Bellevue to determine whether this program could be applicable to the OMSF.

5.3.3 Project-Specific Mitigation Developed by Sound Transit

Lacking an approved mitigation bank, and if agreements to utilize the King County Mitigation Reserves Program cannot be reached, Sound Transit would mitigate for unavoidable impacts through permittee-responsible, project specific mitigation in accordance with the mitigation ratios specified in the Lynnwood and Bellevue critical area codes and in accordance with the procedures outlined by Ecology and the Corps for selecting mitigation sites using a watershed approach (Hruby et al. 2009). Sound Transit would also utilize Ecology's credit-debit tool, in conjunction with each jurisdiction's critical area mitigation ratio requirements, to determine the appropriate amount and types of compensatory mitigation to appropriately compensate for the specific functions and degree of functions provided by the types of wetland impacts (Hruby 2012).

5.3.3.1 Mitigation for Impacts from the Lynnwood Alternative

Sound Transit would utilize the wetland mitigation ratios specified in the Lynnwood critical areas code (17.10.055), to propose mitigation for unavoidable wetland impacts. Compensatory mitigation ratios are specified by wetland category, assuming wetland creation or restoration in the same drainage area as defined by the City's comprehensive flood and drainage management plan, as follows:

- Category I: 6:1
- Category II: 3:1
- Category III: 2:1
- Category IV: 1.5:1

Consequently, the 1.6 to 1.8 acres of impact on the Scriber Creek wetland (Wetland N1-1, Category II) and the 0.4 acres of impact on Wetlands N1-3 and PWLY2 (Category III), would require at least 5.6 to 6.2 acres of mitigation according to the Lynnwood requirements.

A larger area of mitigation could be required under Ecology's credit-debit tool if portions of Wetland N1-1 are determined to be mitigation for past impacts on wetlands.

Given the high functions of the Scriber Creek wetland (Wetland N1-1) and the potential for impacts on an area that may be compensatory mitigation for past wetland impacts, a larger area of mitigation could be required under Ecology's credit-debit tool, particularly in the absence of a basin plan, and for the loss of forested wetland communities if mitigation is concurrent (or delayed in time) relative to the proposed impacts.

Opportunities

Specific compensatory mitigation sites for unavoidable impacts on wetlands (and other ecosystem resources) will be determined during final design and project permitting. Currently identified opportunities include wetland and stream mitigation opportunities present in the Scriber Creek vicinity near the Lynnwood Transit Center. Mitigation opportunities exist on parcels that are under both public and private ownership, including parcels that could be acquired by Sound Transit because they intersect with areas needed for the Lynnwood Link Extension light rail right-of-way. These mitigation opportunities may include wetland creation, restoration, or enhancement.

5.3.3.2 Mitigation for Impacts from the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative

Sound Transit would use the wetland mitigation ratios specified in the Bellevue critical areas code (20.25H.105.C), to propose mitigation for unavoidable wetland impacts. Compensatory mitigation ratios are specified by wetland category, assuming wetland creation or restoration on-site and in-kind, and concurrent with the impact, as follows:

- Category I: 6:1
- Category II: 3:1
- Category III: 2:1
- Category IV: 1.5:1

Consequently, the range of direct impacts (0.07 to 0.6 acre, depending on alternative) to the Category III and Category IV wetlands in the Goff Creek and West Tributary of Kelsey Creek basins would require approximately 0.2 to 1.2 acres mitigation according to the Bellevue requirements. Additional mitigation may be required for indirect impacts, such as to Wetlands E1-1a and E2-6. Similar to the Ecology credit-debit tool, Bellevue also requires consideration of the particular functions provided by each wetland when choosing sites and designing wetland mitigation.

A larger area of mitigation could be required under Ecology's credit-debit tool if all or part of Wetland E3-3 is determined to be mitigation for past impacts on wetlands.

Opportunities

Specific compensatory mitigation sites for unavoidable impacts on wetlands, wetland buffers, stream corridors, and other ecosystem resources will be determined during final design and project permitting. Currently identified opportunities include the potential for improving fish passage within the West Tributary Kelsey Creek, implementing other habitat restoration and water quality improvements, and for completing wetland and stream mitigation in conjunction with the City's plans for daylighting and restoring portions of Goff Creek downstream of the SR Alternative site and upstream of Bel-Red Road. The removal of fish passage barriers is part of the City's vision for the Bel-Red Corridor (City of Bellevue 2012). Mitigation for the SR 520 Alternative could also include rerouting Goff Creek to a partially daylighted channel along the western and southern edges of the SR 520 Alternative site.

Barrier removal is generally viewed to be one of the more cost-effective approaches to riverine habitat restoration in Pacific Northwest ecosystems (Beechie et al. 2010). However, in watersheds that are highly fragmented by numerous fish passage barriers and degraded by extensive urban development, barrier removal may not realize substantial benefit unless it is implemented in the context of a broader restoration strategy. Sound Transit will coordinate with local and state agencies to identify habitat mitigation measures that will provide the greatest benefit to ecosystem function in the Kelsey Creek and Scriber Creek watersheds.

Chapter 6
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Appendix A

Best Management Practices for Sensitive Ecosystem Resources

Appendix A

Best Management Practices for Sensitive Ecosystem Resources

The following list of measures is a compilation of best management practices (BMPs) that can be used to avoid and minimize temporary construction and permanent operational impacts of the East Link project on sensitive ecosystem resources. These BMPs are either required by state or federal agencies to obtain permits required for the project or may be required to comply with typical permit conditions. They are based on Sound Transit's knowledge of permit requirements and experience with conducting environmental compliance and permitting for numerous other projects in the Puget Sound area.

Construction-Related BMPs

General BMPs for All Sensitive Areas

The project would delineate construction limits for vegetated and habitat areas that may be disturbed during construction. The intent is to prevent unintended impacts on riparian vegetation, wetlands, woodlands, and other sensitive sites outside of the construction limits. The construction limits would be clearly marked with high-visibility construction fencing prior to any ground-disturbing or construction-related activities. There would be no direct site disturbance outside of the construction limits.

Soil or rock stockpiles, excavated materials, or excess soil materials would be prevented from eroding into sensitive habitats, including stream channels, wetlands, and riparian areas outside of the construction limits by high water or storm runoff. Sound Transit or its construction contractor would develop a Temporary Erosion and Sediment Control plan that would be implemented during construction. This TESC plan would address potential erosion during construction. The contractor would implement the plan before discharging or allowing runoff from the site. Monitoring requirements specified in the TESC would provide feedback to make sure that the erosion control practices are operating properly and effectively. BMPs would be implemented to limit soil compaction in sensitive areas.

Fish and Aquatic Habitat Protection

All work would comply with the terms and conditions set forth in the Hydraulic Project Approval (HPA) issued for the project by the Washington Department of Fish and Wildlife (WDFW). The HPA program is the vehicle through which WDFW regulates activities that affect the bed or flow of waters of the state for the protection of fish life. An HPA is required for construction or structural work associated with any bridge structure or culvert construction within or below the ordinary high water mark (OHWM) of waters of the state.

Seasonal restrictions (i.e., work windows) applied to work conducted below the OHWM would be as required by an HPA issued by WDFW and by the Section 404 permit issued by the U.S. Army Corps of Engineers (USACE).

In accordance with typical requirements of an HPA, when large woody debris must be moved to allow the reasonable use of an over-water or in-water facility, the large woody debris would be returned to the water downstream, where it would continue to provide aquatic habitat function.

All newly installed culverts would be in compliance with Washington Administrative Code (WAC) 220-110-070 (http://wdfw.wa.gov/hab/engineer/w2201170.htm) regarding fish passage requirements. Any affected streambeds, stream banks adjacent to culverts, and at the stream relocation reach, would be permanently restored after in-water work with plantings of native or approved woody and herbaceous species within one year of completion of each phase of construction. Bank protection would follow the guidelines set forth in WDFW's *Integrated Streambank Protection Guidelines* (http://wdfw.wa.gov/hab/ahg/ispgdoc.htm).

Water Quality

The federal Clean Water Act (CWA) (1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the CWA is the National Pollutant Discharge Elimination System (NPDES) permit program, which is administered by the U.S. Environmental Protection Agency (EPA). EPA has delegated responsibility to administer the NPDES permit program to the State of Washington on the basis of Chapter 90.48 of the Revised Code of Washington (RCW), which defines the Washington State Department of Ecology (Ecology) authority and obligations in administering the wastewater discharge permit program.

Ecology's construction stormwater general permit is required for certain construction activities. The goal of the permit is to reduce or eliminate stormwater pollution and other impacts on surface waters from construction sites.

The project must complete a Notice of Intent (NOI) for coverage under the permit. The project must also develop a Stormwater Pollution Prevention Plan that implements BMPs for identifying, reducing, eliminating, or preventing sediment and erosion problems on site.

Any materials placed below the OHWM (e.g., cobble or boulders for energy dissipation at culvert ends, streambed gravel or other substrates) would be relatively clean and handled in a way to minimize turbidity. Methods would be used such that it is not expected the project would exceed state water quality standards at the point of compliance (WAC chapter 173-201A) when flow is restored to the work site. To the fullest extent practicable, culverts would be installed, modified, and/or replaced in isolation from stream flow (if there is flow during the work window) by means of a temporary bypass flume, diversion culvert, or by temporarily pumping flow around the in-water work zone. Any temporary dewatering of the in-water work zone would be preceded by work area isolation and fish removal/relocation (as necessary). Fish handling would be conducted by a trained and qualified biologist. Turbid water produced during the course of in-water work would be prevented from discharging to fish-bearing waters or wetlands. Turbid wastewater may be routed to temporary or permanent detention facilities, or to upland areas that provide adequate rates of infiltration.

In accordance with conditions of a typical HPA, heavy equipment used during the course of in-water work would operate from above the OHWM wherever possible. Use of equipment below the OHWM would be limited to that necessary to gain position for work. Drive mechanisms would not enter or operate below the OHWM, except under the terms of the HPA issued by WDFW.

Uncured concrete and/or concrete byproducts would be prevented from coming in contact with streams or water conveyed directly to streams during construction. Any water having direct contact with uncured concrete would be contained and treated or removed from the site (as appropriate) to prevent discharge to streams or wetlands.

Installation of permanent footings and all drilled or pile-driven shafts (and excavated spread footings) below the OHWM (e.g., for culvert endwalls) would be conducted in a manner consistent with Section 404 and other permits issued for the project by the USACE and other parties (as applicable). When constructing drilled shafts, the contractor would ensure that all drilling equipment, drill recovery and recycling pits, and any waste or spoil produced are properly contained to prevent discharge of drill wastes or fluids to any surface water or wetlands.

In accordance with typical Section 401 permit requirements, turbidity would be monitored if in-water work occurs when water is flowing in the streams. Equipment (excluding track-mounted equipment, large cranes, and other relatively immobile equipment) would be refueled and maintenance activities conducted at a distance from the nearest wetlands, ditches, and flowing or standing water approved by regulatory permits. Appropriate spill prevention measures and fuel containment systems would be designed and implemented to completely contain a potential spill as specified in the Spill Prevention and Control Countermeasure plan. If flooding of the work area is expected to occur within 24 hours, all equipment and material would be evacuated from near-stream construction sites. An exception would be for efforts to avoid or minimize resource damage. All equipment that is used for in-stream or in-wetland work would be cleaned prior to operations below the OHWM. Wash-water would not be discharged directly into any water body without pretreatment.

Weed Control

If herbicide use is required during the monitoring period, the type and application of the pesticide should be chosen based upon City of Seattle Tier Tables (http://www.seattle.gov/environment/Pesticides.htm) or other locally accepted methodology. Additionally, Sound Transit's Integrated Pest management Plan (IPM) would provide guidance regarding pesticide use and IPM practices.

Design and Operation BMPs

The project would install permanent storm water runoff treatment and flow control facilities where needed according to the requirements of the 2004 Ecology *Stormwater Management Manual for Western Washington* or the most recently adopted manual.

The project would incorporate stormwater conveyance and management facilities that promote infiltration where applicable.

The project would select, design, and install runoff treatment BMPs that are best suited to the site conditions and best capable of achieving the required levels of treatment (subject to negotiation with the local jurisdiction and/or Ecology). These would or may include natural or engineered dispersion BMPs; biofiltration BMPs such as vegetated filter strips, biofiltration swales, or ecology embankments; wet-pool BMPs; and infiltration BMPs.

The project would not reroute existing drainage configurations to the extent that stormwater from one basin or subbasins is conveyed and discharged to another.

The project would implement IPM techniques, in accordance with current Ecology water quality agreements, to minimize the impact on aquatic and terrestrial environments.

Appendix B

Wildlife Function Field Data Form

Sound Transit East Link Wildlife Functions Field Data Form
(Adapted from WSDOT's Best Professional Judgment [BPJ] Characterization)

Project:
_____ Date: _____
Site ID:
_____ Biologist: _____

Function	Likely or Not Likely to Provide (State Your Rationale), Yes/No, or Number
F. General Habitat Suitability	
1. Area is not fragmented by development.	
2. Upland surrounding area is undeveloped.	
3. Area has connectivity with other habitat types.	
4. Diversity of plant species is high.	
5. Evidence of wildlife use, e.g., tracks, scat, gnawed stumps present.	
6. Distance to disturbance source and type.	
H. Habitat for Amphibians	
1. Cover (i.e., woody debris, rocks, and leaf litter) present.	
2. Woody debris present within area.	
3. Proximity to wetland habitats – distance and type.	
4. Lands within 1 km (0.6 mi) of area are > or = 40% undeveloped.	
5. Wetlands and/or an intermittent or perennial stream within 1 km (0.6 mi) of area.	
6. Presence of movement barrier between above wetland or stream and site being evaluated	
I. Habitat for Mammals	
1. Permanent water present within the area.	
2. Presence of emergent vegetation in areas of permanent water.	
3. Areas containing dense shrubs and/or trees are present.	
4. Interspersion between different strata of vegetation.	
5. Presence of slopes / banks suitable for denning.	
6. Evidence of wildlife use, e.g., dens, tracks, scat, gnawed stumps, etc.	
J. Habitat for Birds	
1. Forested and scrub-shrub classes present within the area.	
2. Average tree height.	
3. Average DBH.	

Function	Likely or Not Likely to Provide (State Your Rationale), Yes/No, or Number
4. Largest DBH and percent of trees in this class.	
5. Relative tree species diversity (L, M, H).	
6. Snags present in area.	
7. Cavities present in trees.	
8. Tree % canopy estimate.	
9. Shrub % canopy estimate.	
10. Adjacent area contains relatively undisturbed grassland or wetland shrub and/or forest habitats.	
11. Lands within 1 km (0.6 mi) of the area are greater than or = 40% undeveloped.	
L. Native Plant Richness	
1. Dominant and co-dominant plants are native.	
2. Area has three or more strata of vegetation.	
3. Area has mature trees (conifer, deciduous?).	
4. Number of species of trees.	
5. Area has well developed shrub layer.	
6. Number of species of shrubs.	
N. Uniqueness and Heritage	
1. Area contains documented occurrence of a state or federally listed threatened or endangered species.	
2. Area contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the USFWS, the WDNR's NHP, or WDFW's Priority Habitats and Species Program.	
3. Area has biological, geological, or other features that are determined rare by the local jurisdiction.	
4. Area has been determined significant by the local jurisdiction because it provides functions scarce for the area	